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CHANGES IN THE DEATH RATE SINCE THE SEVENTEENTH CENTURY

by RENÉ SAND, M. D.¹

IN his fundamental treatise, William Farr² compiled the mean annual number of deaths in London during several periods of the seventeenth, eighteenth, and nineteenth centuries. Choosing years which had been free from pestilence, and excluding the still-born, he quotes the following figures:

London 1660-1679: 80 deaths per 1,000 inhabitants

London 1771-1780: 50

London 1801-1810: 29.2

Today the death rate varies from 27.9 (Egypt) to 8.5 (New Zealand); so that for one death occurring now in New Zealand there were nearly ten deaths in London, two centuries and a half ago.

Let us analyze this reduction. Farr divided the causes of death into twenty classes, among which one represents the external causes (accidents, homicides, suicides), and several others include various infectious diseases. Present-day death rates from external causes for a selected list of countries³ may be compared with the London mortality in the seventeenth century, as follows:

| | |
|---------------------|----------------------------|
| London 1660-1679: | 7.6 per 10,000 inhabitants |
| London 1801-1810: | 4 |
| United States 1932: | 9.86 |
| Chile 1932: | 7.3 |
| Germany 1932: | 6.9 |
| New Zealand 1934: | 5.71 |

¹ Secretary-General of the Ministry of Public Health of Belgium.

² Farr, William: *VITAL STATISTICS*. London, Edward Stanford, 1885, pp. 303-306.

³ I have chosen Chile as representing the group of countries which have the highest general death rate, Belgium as an instance of a moderate mortality. The lowest death rates are found in the Anglo-Saxon and Scandinavian countries, in Switzerland, and in Germany; the lowest of all in South Africa (whites), Canada, Australia, New Zealand and the Netherlands.

| | |
|-------------------------|-----------------------------|
| England and Wales 1934: | 5.62 per 10,000 inhabitants |
| Belgium 1933: | 5.04 |
| Netherlands 1932: | 3.8 |

It is rather surprising to find that—barring the United States—the death rate from external causes is not higher than it was two hundred and fifty years ago in London in spite of our machines, our railways, our motor cars, our airplanes, and our craze for sports. However, except in the Netherlands, it is higher than in London at the beginning of the nineteenth century. The reason is that, in former times, fire and horses represented a much greater hazard than now; and many lives were lost from stagecoach accidents, from burglary, from brawls and quarrels. Human life was insecure and cheap.

As regards infectious diseases, the reduction is stupendous:

| | |
|-------------------------|------------------------------|
| London 1660-1679: | 486.7 per 10,000 inhabitants |
| London 1801-1810: | 147.3 |
| Chile 1932: | 51.3 |
| Belgium 1933: | 15.5 |
| England and Wales 1934: | 13.2 |
| United States 1932: | 12.5 |
| Germany 1932: | 11.8 |
| Netherlands 1932: | 9.6 |
| New Zealand 1934: | 7.3 |

For one person who dies now from an infectious disease in New Zealand, 66 died in London two hundred and fifty years ago. The number is really greater, as croup, whooping cough, nonpulmonary tuberculosis, and several other infectious diseases were not included in Farr's classification. On the other hand, neither his statistics nor ours show in their right places the deaths due to late visceral complications of syphilis, rheumatic fever, typhoid, and diphtheria.

The mortality from infectious diseases represented the following percentages of the total death rate:

| | |
|-------------------|---------------|
| London 1660-1679: | 66.6 per cent |
| London 1801-1810: | 50.4 |

Changes in the Death Rate

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| | |
|-------------------------|---------------|
| Chile 1932: | 22.5 per cent |
| Belgium 1933: | 11.8 |
| United States 1932: | 11.3 |
| England and Wales 1934: | 11.2 |
| Germany 1932: | 10.9 |
| Netherlands 1932: | 10.7 |
| New Zealand 1934: | 8.6 |

For tuberculosis, the reduction is not quite as great; but it is very striking:

| | |
|--------------------------------|------------------------------|
| London 1660-1679: ¹ | 125.5 per 10,000 inhabitants |
| London 1801-1810: ¹ | 71.6 |
| Chile 1932: | 25.5 |
| Belgium 1933: | 7.96 |
| England and Wales 1934: | 7.63 |
| Germany 1932: | 7.5 |
| Netherlands 1932: | 6.4 |
| United States 1932: | 6.24 |
| New Zealand 1934: | 4.2 |

For one death from tuberculosis in New Zealand today, there were thirty deaths in London two hundred and fifty years ago, and even more, as the mortality indicated by Farr relates to phthisis only.

It is interesting to note that the tuberculosis mortality represented 26 per cent of the mortality from infectious diseases in London during the seventeenth century, whereas in 1934 it was 56 per cent of the death rate from infectious diseases in New Zealand.

Deaths caused by violence or infection result from external agencies, from outside attacks upon the human organism. When these are subtracted from the general mortality, there remains a composite group of deaths which may be loosely classified as due to organic diseases. The annual death rates in the various countries from this broad group of causes are:

| | |
|-------------------|-----------------------------|
| London 1660-1679: | 30.57 per 1,000 inhabitants |
| London 1801-1810: | 14.07 |
| Chile 1932: | 16.92 |

¹ Phthisis only.

| | |
|-------------------------|-----------------------------|
| Belgium 1933: | 11.09 per 1,000 inhabitants |
| England and Wales 1934: | 9.90 |
| Germany 1932: | 8.91 |
| United States 1932: | 8.82 |
| Netherlands 1932: | 7.66 |
| New Zealand 1934: | 7.18 |

The mortality from these has also considerably diminished, although not in the proportion shown by the death rate from infectious diseases, as these organic diseases include cancer, against which we are comparatively impotent, as well as the diseases of old age. Still the death rate from organic diseases is now in New Zealand only 23 per cent of what it was in London two hundred and fifty years ago. A great part of this reduction originates in the saving of infant life, the rest in the saving of adolescents and adults from various noninfectious diseases. These advances are due to the progress of medicine, public health, nursing, hospitals, labor conditions, housing, social welfare, general and health education, in other words to the advance of science and the raising of the standard of life.

From these so-called organic diseases, we can single out two groups: malignant tumors and the wear and tear diseases.

I will not enter into the comparison of the cancer death rates in different countries, as they depend so much on the accuracy of the death certificates, on the available facilities for scientific diagnosis, and on the age composition of the population.

The wear and tear diseases form an interesting group, because they represent the natural termination of life. To die from accident, infectious disease, cancer, appendicitis, diabetes, gastric ulcer, or to die in childbirth is abnormal. To die from the progressive weakening of the heart muscle, from the gradual sclerosis of the vessels, is the normal death, even if the end is marked by an episode like apoplexy or bronchopneumonia.

How can we get an idea of the proportion of these natural deaths?

We cannot simply say that everyone dying after 75 or 80 enters into this category, because the normal life span is different from individual to individual, according to his or her constitution. If, on the other hand, we scrutinize individually the various causes of death, we will find no adequate answer, as every one of the lethal diseases, except senility, may have various origins.

We must be satisfied consequently with a somewhat gross approximation. Our aim is to estimate the number of deaths due to the chronic changes which age brings mainly in the heart and blood vessels. We will take as our first figure the total number of deaths from senility, from apoplexy, from noninfectious and non-cancerous diseases of the circulatory organs and of the kidney. This, of course, includes a certain proportion of deaths due to the late visceral complications of syphilis, rheumatic fever, and other infectious diseases; to the abuse of alcohol; to acute diseases of the heart, blood vessels, and kidney. However, if we consider that in England among the total deaths from senility, diseases of the circulatory organs, nephritis and apoplexy, 74 per cent occurred at the age of 65 or over, we come near the truth in taking as the number of deaths caused by wear and tear 75 per cent of the total figure mentioned. To these deaths, we should add those deaths from chronic bronchitis, bronchopneumonia, pneumonia, congestion and infarct of the lungs which are the last episode of old age. If we reckon as such the cases in which death has occurred at 70 or later, this would increase our total by 7 per cent. On the whole, a reduction of 20 per cent on our first figure is the best estimation we can make of the number of natural deaths.

The total number of deaths from senility, apoplexy, and diseases of the heart, blood vessels, and kidneys was:

| | |
|-------------------------|----------------------------|
| Belgium 1933: | 4.92 per 1,000 inhabitants |
| England and Wales 1934: | 4.75 |
| United States 1932: | 4.36 |
| Germany 1932: | 3.8 |

| | |
|-------------------|---------------------------|
| New Zealand 1934: | 3.7 per 1,000 inhabitants |
| Netherlands 1932: | 3.07 |

Reduced by 20 per cent, these figures would give us the approximate rate of "natural deaths."

However, in this case, the interesting point is not so much the absolute number as the proportion of "natural deaths" in the total death rate:

| | |
|-------------------------|--|
| New Zealand 1934: | 43.7 per cent (35 per cent with a 20 per cent reduction) |
| England and Wales 1934: | 40.4 per cent (32 per cent with a 20 per cent reduction) |
| United States 1932: | 39.4 per cent (32 per cent with a 20 per cent reduction) |
| Belgium 1933: | 37.4 per cent (30 per cent with a 20 per cent reduction) |
| Germany 1932: | 35.2 per cent (28 per cent with a 20 per cent reduction) |
| Netherlands 1932: | 34.1 per cent (27 per cent with a 20 per cent reduction) |

The proportion of "natural deaths" in the above countries, varying from 27 to 35 per cent, is remarkably high. Corroboration of this high proportion of "natural deaths" is found in the number of deaths at late ages. Thus, in Belgium, 45 per cent of all deaths occur at the age of 65 or later, 35 per cent at 70 or later, 24 per cent at 75 or later. And the proportion of late deaths is still higher in the other countries listed above.

Statisticians bent on strict precision will point to the evident inaccuracy of a method which labels whole groups of diseases as caused by the wear and tear of the body. I believe, however, that with the corrections mentioned, we get an approximation—nothing else could be aimed at—which is significant. Small differences in the proportions for different countries are not significant but the rate for "natural deaths," thus obtained, can be taken as a fairly reliable general indication of sanitary, medical, and social progress.

A STUDY OF THE EFFECTIVENESS OF CERTAIN ADMINISTRATIVE PROCEDURES IN TUBERCULOSIS CONTROL¹

by JEAN DOWNES

THE necessity of measurement of the effectiveness of public health procedures can scarcely be questioned even though precise and complete evaluation offers many difficulties. Measurement is of especial importance in the field of tuberculosis control. A declining mortality and a possibly declining prevalence of infectious cases or the reverse situation in the individual community may change the need for certain procedures. To be most effective a program for control of the disease must be adapted to the changing needs within the given locality. Also, the fact that a considerable proportion of the public health budget is used for the prevention of tuberculosis presents a definite challenge to the administrator to see that the money appropriated is wisely expended.

To ascertain the effectiveness of a given procedure in the tuberculosis program it is necessary (1) to define the objective or objectives of the procedure in as precise terms as possible and (2) to test the accomplishment of the objective by comparison with the results of other procedures having the same objective or by comparison with suitable controls. This study is an attempt to show how some of the values of administrative procedures within a given community may be tested. Various methods of case finding, the isolation of the positive sputum case, and the results of change in policy regarding the education of the patient in respect to tuberculosis may be appraised through the analysis of records which should be available to the administrator for his constant use.

¹ From the Milbank Memorial Fund.

Acknowledgments are made to the Cattaraugus County Department of Health and to the New York City Department of Health for access to the records and especially to Dr. John H. Korn, director of the Bureau of Tuberculosis, Cattaraugus County Department of Health, whose interest and cooperation have facilitated the study.

CASE FINDING

Case finding is a fundamental procedure in the control of tuberculosis no matter what type of community is considered. Its primary objective is to discover the unknown foci of infection and those cases which may become foci of infection. There are the more usual methods of finding cases, such as case reporting by the practicing physicians, diagnostic clinic examination of persons with suspicious symptoms, and examination of family contacts. There are also supplementary ways of case finding, such as tuberculin testing and X-raying of school children and other population groups. It is advisable to test these methods to see which are most effective in attaining the objective in a given community.

Data showing the results of the various ways of case finding utilized in Cattaraugus County may be used to illustrate most strikingly the effectiveness of these methods in this particular community. Figure 1 shows for the period 1928-1932 the proportion of persons

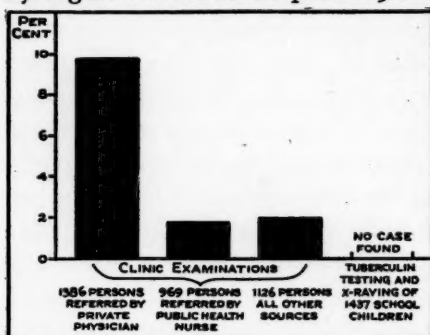


Fig. 1. A comparison of the proportion of persons found to have adult pulmonary tuberculosis through the various referring agencies of the diagnostic clinic and the tuberculin testing of school children in Cattaraugus County, New York, 1928-1932.

tuberculosis were discovered among the 1,437 children surveyed in the schools. From 2 to approximately 10 per cent of persons referred to the diagnostic clinic had adult pulmonary tuberculosis. It is plainly

persons found to have adult pulmonary tuberculosis in the clinic groups referred by practicing physician, public health nurse, and "all other sources" compared with the result of finding such cases by means of tuberculin testing and X-raying a random sample of the school children. No new cases of adult pulmonary tuber-

evident that the diagnostic clinic has served more effectively in the discovery of cases which may be spreaders of the disease than the method of surveying school children of all ages.

This analysis was made early in 1933 and as a consequence Dr. Korns, director of the Bureau of Tuberculosis in Cattaraugus County, has attempted to make the case-finding program more effective by requiring careful selection of persons referred from miscellaneous sources (designated as "all other" on the chart) and by substituting the X-raying of a limited age group (high school juniors and seniors) for the more general survey of school children of all ages.² Two cases of active adult pulmonary tuberculosis, both in the minimal stage, were discovered among 1,112 high school juniors and seniors X-rayed during the year 1935. There can be little doubt of the wisdom of discarding case finding among the entire school population in this particular area and substituting for it the examination of a selected group, high school juniors and seniors, since at these ages the incidence of active disease is known to be relatively high.

Data drawn from the tuberculosis clinics of the Bellevue-Yorkville Health Center in New York City for the year 1931 are available for a comparison of case finding in various clinic groups and are shown in Figure 2. There were two distinct clinics at Bellevue-Yorkville: one a consultation clinic which admitted for examination and diagnosis only persons referred by private physicians; the other a district clinic which admitted persons referred by public health and visiting nurses, social agencies, and other agencies. The upper part of Figure 2 shows that the most highly selected group for case finding was that composed of persons referred by private physicians to the consultation clinic where 17 per cent of 1,729 persons was found to have pulmonary tuberculosis contrasted

² The clinic group referred by public health nurses is made up almost entirely of first examination of family contacts among whom the yield in cases will not be great at a limited time period. It was not considered necessary to limit this group but rather to extend it by securing examination of all family contacts.

with slightly less than 5 per cent among persons referred to the district clinic.

When persons examined in the district clinic are classed accord-

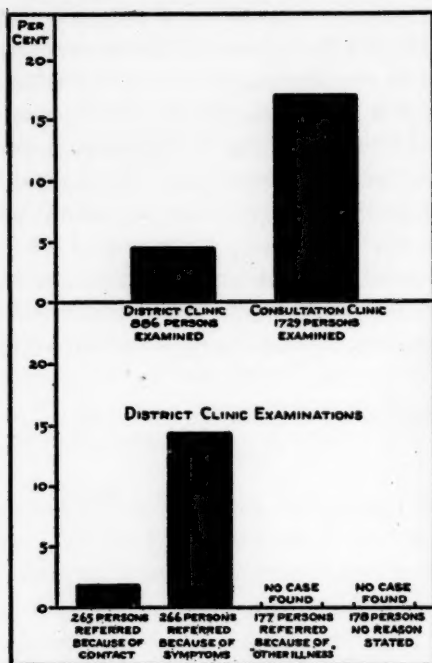


Fig. 2. A comparison of the proportion of persons found to have adult pulmonary tuberculosis through examinations made in the district clinic and the consultation clinic in the Bellevue-Yorkville district of New York City, 1931.

all contacts in different types of families in New Haven was made by Dr. H. R. Edwards, then director of the Bureau of Tuberculosis, and Miss Unzicker, supervisor of tuberculosis in the Visiting Nurses'

³ Under "symptoms of tuberculosis" the following complaints were classed: fatigue or worn-out feeling, loss of weight, cough with or without sputum, dyspnea, hemorrhage, fever, night sweats, and cold of unusual duration (two weeks or longer). The following complaints were classed as "other illness": pain in back, side, or abdomen; grippie; acute cold; indigestion; and dizziness.

ing to the reason for being referred, as shown in the lower part of the chart, it is evident that active pulmonary tuberculosis was found only among those who were contacts to cases or were examined because of symptoms suggestive of tuberculosis.³ These two groups are important for case finding and include only 60 per cent of the 886 persons examined. Thus by more careful selection of patients 40 per cent of those attending clinic could safely have been excluded from examination for tuberculosis.

An analysis of the cost of case finding among

Association.⁴ The families were divided into three groups: (1) those in which the index case was pulmonary tuberculosis, (2) families in which the index case was a child with a positive tuberculin, and (3) those in which the index case was one of tuberculous meningitis. The authors considered that pulmonary tuberculosis of the adult type was the significant finding in each group and concluded that from the standpoint of the dollar invested there was justification for placing emphasis upon case finding among family contacts in groups (1) and (3) but that families in which the index case is a positive reactor to tuberculin do not warrant intensive study or search for tuberculosis cases.

These examples drawn from Cattaraugus County, Bellevue-Yorkville, and New Haven illustrate the importance of the evaluation of the results of various procedures for case finding utilized in individual communities.

ISOLATION OF THE POSITIVE SPUTUM CASE AS A MEANS
OF PREVENTING THE SPREAD OF INFECTION

More and more emphasis is being placed on sanatorium care for the infectious case of tuberculosis not only for purposes of cure but also for the prevention of the spread of infection among persons in the home and in the community. The extent to which this latter objective has been attained is capable of some measurement in an area such as Cattaraugus County. Families in which the primary or index case with a positive sputum was reported or diagnosed within a recent period of time may be compared with a similar group of families drawn from an earlier period. In these two groups only families in which there were persons under 20 years of age may be considered.

During the period 1931 to October, 1935, there was a total of forty-one families in which the primary case had a positive sputum and in which there were family members under age 20. The rate of

⁴ Edwards, H. R. and Unzicker, Grace: A Cost Analysis of Clearing Tuberculosis Family Contacts. *The Milbank Memorial Fund Quarterly*, October, 1934, xii, No. 4, pp. 306-316.

tuberculous infection among persons 0-19 in these forty-one families may be compared with the rate at similar ages in a group of fifty-one families drawn from the period 1923-1930 in which the primary case had a positive sputum. The fifty-one families are believed to constitute a representative sample of the total families in which a case of infectious disease was reported or discovered during the period 1923-1930.⁵

Among the forty-one families for the period 1931 to October, 1935, 88 per cent of the contacts under 20 years of age was tuberculin tested contrast-

Table 1. Tuberculous infection rate among persons 0-19 years of age exposed to a positive sputum case in fifty-one families (1923-1930) contrasted with those at similar ages exposed in forty-one families in a more recent period of time (1931-October, 1935).

| Family Groups | Total Family Contacts Tuberculin Tested (0-19 Years of Age) | Total Positive to Tuberculin | Rate per 100 Persons |
|---|---|------------------------------|----------------------|
| Group I (51 families) (1923-1930) | 120 | 89 | 74.2 ± 2.63 |
| Group II (41 families) (1931- Oct. 1935) | 83 | 45 | 54.2 ± 3.69 |
| Difference | | | 20.0 ± 4.56 |

ed with 70 per cent of persons at similar ages in the fifty-one families drawn from the period 1923-1930.⁶ The infection rate as shown in Table 1 for the fifty-one families (1923-1930) was 74.2 contrasted with a rate of 54.2 per 100 persons under 20 years of age in the forty-one families. If these rates are adjusted for age the difference is even greater, 74.2 compared with 51.6 per 100 persons aged 0-19 years.⁷ The difference in the infection rate for the two groups of families (20.0 ± 4.56) is more than four times its probable error and may be

⁵ The sample was selected in the following manner. All new active cases reported in the County during the years 1923-1930 were classified according to residence, by individual towns or townships for the rural part of the County, and by each of the two urban areas. It was desired to draw from this material a sample of 100 tuberculous families which would be representative of all areas of the County. Names were accordingly drawn at random from the various lists according to the proportion of the total population resident in the various civil units. In fifty-one of these families the primary or index case had a positive sputum and there were children under 20 years of age in the home.

⁶ All persons tested were given the intracutaneous test with 0.1 mgm. of Old Tuberculin.

⁷ Ratio adjusted to the combined population of the two groups of families.

considered as statistically significant since such a difference will arise by chance less often than once in a hundred times.

That this decline in the infection rate is probably associated with an improvement in the extent to which sanatorium care was obtained for the infectious cases and the speed with which they were hospitalized may be shown by a comparison of the two groups of families. In the fifty-one families (1923-1930) 70 per cent of the infectious cases had sanatorium care contrasted with 80 per cent of those in the forty-one families (1931-October, 1935). There was a marked difference in the speed with which sanatorium care was secured for the cases in the two groups. Within one month after diagnosis or reporting, 76 per cent of the total cases having treatment in the forty-one families was in the sanatorium contrasted with 44 per cent in the families drawn from the earlier period; 31 per cent of the infectious cases treated in the fifty-one families remained in the home for more than a year before sanatorium care was secured contrasted with only 9 per cent in the other group.

Whether or not the procedure of isolation of the infectious case in the sanatorium has altered the extent of the spread of infection in the community can hardly be answered precisely from the available data. However, among 1,062 children under 16 years of age not known to have had contact with positive sputum cases and tuberculin tested in the clinics in the County during 1928-1930, 166, or 15.6 per cent, had a positive reaction contrasted with 4 per cent of 753 children tested in the clinics in 1933-1935.⁸ The two groups had a comparable age distribution and it is believed that the difference in these rates offers some evidence that the spread of tuberculous infection in the community is being lessened.

CHANGE IN PERIOD OF TIME WITHIN WHICH CONTACTS ARE EXAMINED

One of the important procedures for the control of tuberculosis is the examination of family contacts to tuberculosis cases. It has two objectives, that of case finding or seeking the source of infection of

⁸ From the Annual Report of the Cattaraugus County Department of Health, 1935.

the first case noted in the family, and supervision in order to prevent the spread of serious disease among the family members. Securing the examination of family contacts is usually considered the responsibility of the public health nurse. However, in Cattaraugus County in recent years the director of the Bureau of Tuberculosis himself has undertaken a definite part of the education of the individual patient with respect to the nature of tuberculosis as an infectious disease. Both in the clinic and in the sanatorium the patient has been made aware of the importance of the prompt examination of the family contacts. It was believed that this would facilitate the work of the public health nurse in the home and it is interesting to see whether or not there has been improvement in the promptness and completeness with which these examinations have been secured in recent years compared with the past.

For such a comparison, records for the families of all new active cases reported during the period January, 1932, to October 1, 1935, and an additional nineteen families in which an active case was reported in 1931, comprising a total of 118 families, may be contrasted with a sample of eighty-seven families drawn from the period 1923-1930.⁹ Since four and one-half years is the longest possible period of observation for any of the families drawn from the more recent period, the examination of contacts for the sample of eighty-seven families is limited to 4.5 years after the diagnosis of the index case in the family.¹⁰

Table 2 shows the total number of contacts, according to age, in each of the two groups of families and the per cent of contacts examined. The proportion of contacts under 20 years of age examined is approximately the same for both groups of families. However, 57 per cent of the adult contacts 20 years or older was examined in the Group II families (more recent period) contrasted with 33.3

⁹ For method of selection of the sample see footnote 5.

¹⁰ The two groups of families were found to be comparable with respect to the following: the proportion in which the index case was pulmonary or non-pulmonary tuberculosis, the proportion with positive or negative sputum, and the position of the case in the household.

per cent of contacts in the same age group in the families drawn from the earlier period. Some improvement is noted in the proportion of total contacts examined in families in Group II contrasted

Table 2. Per cent of contacts examined in eighty-seven families in which the index case was diagnosed during the period 1923-1930 compared with 118 families in which the index case was diagnosed during the period 1931-October, 1935.

| Family Groups | Total Contacts | Contacts Examined | Per Cent Examined |
|---------------------------|----------------|-------------------|-------------------|
| Under 20 Years of Age | | | |
| Group I (1923-1930) | 203 | 143 | 70.4 |
| Group II (1931-Oct. 1935) | 182 | 127 | 69.8 |
| Over 20 Years of Age | | | |
| Group I (1923-1930) | 195 | 65 | 33.3 |
| Group II (1931-Oct. 1935) | 248 | 141 | 56.9 |
| All Ages | | | |
| Group I (1923-1930) | 398 | 208 | 52.3 |
| Group II (1931-Oct. 1935) | 430 | 268 | 62.3 |

Group I families (1923-1930) had the first clinic examination within six months after the index case in the family was known, contrasted with 87 per cent in the Group II families. In the Group I families, approximately 19 per cent of the examined contacts had a first examination two years or more after the index case was known, and for only 3 per cent of contacts examined in the Group II families was the interval of time so long.

Both Tables 2 and 3 show improvement in the examination of family contacts. Not only is there a higher proportion of contacts examined in the families reported in the more recent period but also the contacts are now placed under clinic supervision much more quickly than previously. It is believed that these facts cannot

with those in the sample of eighty-seven families, namely, 62 per cent compared with 52.

When the examined contacts are distributed according to the interval of time between the report of the primary or index case in the family, and the first examination of the contacts as shown in Table 3, considerable difference between the Group I and Group II families is noted. Only 48 per cent of the examined contacts in the

be interpreted as necessarily an indication of increased effort or supervision, in terms of visits to the family, on the part of the public health nurse. In fact the average number of visits to the home by the public health nurse has shown a decrease when the more recent period is compared with the earlier period. In a sample of families drawn from the period 1923-1930 there was an average of 11.6 visits per year to the home, contrasted with 7.1 visits per year for families in the period 1931-October, 1935.¹¹ It is sufficient to say that it appears that the work of the public health nurse in securing the prompt examination of family contacts

Table 3. Interval of time between reporting of a case of tuberculosis and the examination of the family contacts.

| Family Groups | Interval of Time Before First Examination | | | |
|--------------------------------|---|--------------------|-----------|-----------------|
| | Within 6 Months | 6 Months to a Year | 1-2 Years | 2 Years or More |
| Contacts Under 20 Years of Age | | | | |
| Group I (1923-1930) | 48.3 | 20.3 | 12.6 | 18.9 |
| Group II (1931-Oct. 1935) | 87.4 | 5.5 | 3.9 | 3.1 |
| Contacts Over 20 Years of Age | | | | |
| Group I (1923-1930) | 50.7 | 18.5 | 4.6 | 26.2 |
| Group II (1931-Oct. 1935) | 79.5 | 5.0 | 10.6 | 5.0 |

has been accelerated and this improvement is probably due to a number of factors operating in the community over a period of years, not the least of which are the increasing awareness of the practicing physician and of the patient as to the importance of the examination.

The data in this study have been used to show that evaluation of procedures for tuberculosis control within a given community may be of practical advantage to the administrator. Various methods of case finding have been compared; sanatorium care of the positive sputum case as a means of preventing the spread of infection in the

¹¹ The data for nursing visits are based on records covering a period of two years for seventeen families drawn from the period 1923-1930 and records for eighteen families covering a similar period of time drawn from the more recent period 1931-October, 1935. It was desired to have the families comparable with respect to the proportion in which the index case had sanatorium care and the amount of sanatorium care within the two-year period after the index case was known. It is obvious that the presence of the active case in the home will modify the need for nursing visits. Consequently only a small group of families could be used for comparison.

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home and in the community has been appraised; both the extent and promptness of examination of family contacts have been tested for improvement. It is not sufficient to test procedures only on the basis of what is believed to be the net effect of all of them. Rather, specific procedures should be tested for effectiveness and those should be eliminated which seem unnecessary in a particular community. Only in this way can a public health program for the control of tuberculosis be evolved which will be both flexible and efficient.

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GONORRHEA

by N. A. NELSON, M. D.¹

TWO movements in the United States, opposite in direction, once more raise the question of what is to be done about gonorrhea. One owes its direction to the deliberate decision of some health officials to push the program for the control of syphilis to the neglect of that for the control of gonorrhea. This movement is carrying with it many of the voluntary health agencies which have become interested in the programs for the control of the genito-infectious diseases.² The other depends upon the equally deliberate decision of the medical profession to do something about this "step-child" of medicine, the most neglected of all communicable diseases.

In 1934, the American Neisserian Medical Society was organized as a result of the wide interest aroused by the activities of the then four-year-old Neisserian Medical Society of Massachusetts. This new medical society has stirred the imagination of physicians. Only two years old, it has increased its membership from an original twenty-one to three hundred and twenty-one, from thirty-eight states, Canada, Cuba, and Puerto Rico. The quality of its membership and leadership is attested to by the fact that its first three presidents have been Doctors J. Dellinger Barney of Boston; P. S. Pelouze of Philadelphia; and Thomas Parran, Surgeon General of the United States Public Health Service. Dr. Edward L. Keyes is its life-time Honorary President. Such champions of the better management of gonorrhea as Doctors R. D. Herrold of Chicago, C. C. Norris of Philadelphia, C. M. Carpenter and S. L. Warren of Rochester, and Oscar F. Cox, Jr., of Boston, have served or are serving as members of its executive committee.

It is unfortunate, since the Cinderella of Medicine seems, at last,

¹ From the Massachusetts Department of Public Health.

² Proposed as a substitute for the term "venereal disease." Nelson, N. A.: Editorial. *American Journal of Syphilis, Gonorrhea and Venereal Diseases*, July, 1936.

to have found a Godmother, that so many health agencies should now lose interest in the control of gonorrhea.

Gonorrhea is closely related to syphilis epidemiologically. Although the therapeutic armamentarium lacks the specificity of the arsphenamines, there is no reason why better use should not be made of it, such as it is, nor why the public should not be as well informed concerning gonorrhea as concerning syphilis.

Interest breeds interest. Serious research for better drugs and better procedures will be encouraged by the universal demand for results which would be created by general knowledge of the problem.

Syphilis has been dramatized. Paresis, tabes, interstitial keratitis, congenital syphilis, and other well-known forms of the disease, have led to its characterization as the Great Imitator, the Crippler, the Killer, and the Abortionist. There is little of the dramatic in a urethral discharge or a leucorrhea. Few women realize, and the public does not know at all, that pus tubes, pelvic inflammation, the majority of major operations involving the contents of the female pelvis, much of the morbidity known as "female trouble," and altogether too much sterility, are the result of unsuspected and undiagnosed gonococcal infections. There is enough of drama and tragedy to be found in gonorrhea if the world will but see the obvious. A fleeting but effective interest in the disease was created by its dramatization as gonococcal ophthalmia neonatorum, witness the laws in every state for its prophylaxis!

Pelouze³ exclaims with justification, "It would seem that by the sheer weight of the misery it produces throughout the world, gonorrhea would force itself upon public notice." Old as history, it was described, and methods for its control prescribed by Moses. Its trail may be followed through the medical records of all the ages of mankind. In spite of the nuisance it has been and the damage it

³ Pelouze, P. S.: GONORRHEA IN THE MALE AND FEMALE. Philadelphia, W. B. Saunders, Co., 1931.

has done since the beginning of time, so little has been accomplished in the direction of its control that it remains, as it has always been, among the most prevalent of all communicable diseases.

Ignored by the medical profession, it became the pot of gold at the end of the rainbow of Quackery, whether of the blatant, advertising kind, or of the drug store, or of the more "refined" therapeutic house concoction. The ethical physician became fearful of endangering his own reputation by accepting the infected for treatment. Those who dared to assume the responsibility found not only that their training as to how to manage the disease had been sadly neglected, but that the drug-house salesman was the only source of therapeutic information. The result was failure to make the diagnosis (or fear of the patient's wrath if it was made), treatment of symptoms without knowledge of the true nature and pathology of the disease, and dependence upon the newest short-cut "cure-all" to the neglect of even the most obvious and most elementary principles of procedure.

The urologist, in whose field of genito-urinary medicine and surgery the management of gonorrhea rightly belongs, has been too busy with cystoscopy, prostatectomy, and what not, to permit more than the occasional discussion of the gonococcus and what it does to the genito-urinary system, at his meetings. He has wanted nothing to do with this business of the "clap doctor" nor with the "immoral scum" who have the "nasty" disease. Thus innocent wives and girl children and babies continue to pay the Piper because the world has been so busy looking down its nose at the guilty that it has been unable to focus its attention upon the unfortunates in the background.

Those who do see the problem in its true perspective know that although the therapeutic armamentarium is elementary and non-specific, and effective only when accompanied by strict control of the patient's behavior, much can be done to shorten the course of the disease and prevent the spread of infection. They know that if

they could but reach the infected at the beginning rather than after months of futile, often damaging, unintelligent treatment, they could accomplish the solution of a great part of the problem. There is nothing very complicated nor difficult about the management of an acute anterior urethritis, nor even of an acute anterior-posterior infection if it is undertaken sensibly, with the cooperation of the patient, and it has not been complicated by previous injudicious meddling.

The medical profession and the public are fortunate in that there are at hand specific remedies for a few diseases. The physician does not throw up his hands, however, because he does not have specific therapies for most of them. The treatment of tuberculosis and cancer must be far more discouraging than the treatment of gonorrhea ever could be, yet the management of those diseases is regularly undertaken with a hundred-fold more enthusiasm. The difference lies in the fact that tuberculosis and cancer have been so dramatized that both public and physician are conscious of their seriousness, while gonorrhea is thought of primarily as a nuisance, more or less the just reward of prostitutes and their consorts.

It is quite impossible to determine, or even to estimate the prevalence of gonorrhea. Studies made in a few large cities indicate that from a half to two-thirds of the infected seek treatment first at a drug store. Many of these, unless complications supervene, never reach medical attention. Furthermore, the diagnosis is so often missed in the female, particularly in the married female, that thousands of infections never become recorded as such. It is probable, also, that no reportable communicable disease is so poorly reported.

The United States Public Health Service recently published a valuable analysis of data collected over a number of years by means of "one-day prevalence studies."⁴ The information thus acquired

⁴Usilton, Lida J.: The Trend of Syphilis and Gonorrhea in the United States. *Veneral Disease Information*. (United States Public Health Service.) May, 1935, 16, No. 5, pp. 147-164.

for some twenty-nine millions of the country's population was then applied to the total population. Prominent among the conclusions were these:

That 1,037,000 fresh infections with gonorrhea and 518,000 fresh infections with syphilis reach medical attention annually.

That a second million persons with gonorrhea or syphilis in later stages also seek medical attention annually.

That on any given day, nearly 650,000 persons with syphilis and nearly 500,000 persons with gonorrhea are under treatment or observation.

That the number of fresh infections with gonorrhea which actually reach medical attention outnumber those reported to health departments nearly seven to one.

That gonorrhea is more prevalent in rural than in urban communities, thus confirming United States Army findings among draftees during the war.

That the ratio of fresh infections with gonorrhea under medical care to fresh infections with syphilis under medical care is as two to one.

That the ratio of male to female infections with gonorrhea under medical care is nearly three to one, while that for syphilis is three to two.

The Massachusetts Department of Public Health has collected reports of gonorrhea and syphilis since March 1, 1918. By the close of 1935 it had received 108,560 reports of gonorrhea and 55,289 of syphilis. The following analysis of these reports may have some value, not as a measure of the actual prevalence of gonorrhea, but as an analysis of a large sample.

From 1918 to near the end of 1925, all forms of both diseases were reportable directly to the State Department of Public Health. Some detailed information is available from the reports of that period. From 1926 to 1929, inclusive, reports were made to local boards of health, which forwarded a part of the data to the Department. For those years only the most elementary facts are available. From 1930 to date, reports have been made directly to the Department and full analysis of the data therein is possible.

Study of the reporting during these three periods is enlightening.

(Table 1). The year 1919 was the first full year of reporting. It was the first year after the war when war-time enthusiasm for the control of gonorrhea and syphilis still made itself felt. Reports reached a peak of 9,435 cases of gonorrhea and 4,127 of syphilis. Public interest then declined and reporting reached its ebb in 1929 when only 4,410 cases of gonorrhea and 1,531 of syphilis were reported.

Since the beginning of 1930, the reporting system has been revised and simplified. Postage is paid and a steady program of service to physicians has been maintained. In 1935 there were reported 6,193 cases of gonorrhea and 5,317 of syphilis. From 1924 to 1928 the Department maintained no active program. Since 1928 an extensive program has been developed thus restimulating interest, especially among physicians and allied professions. It is obvious that health department activity reflects itself in reporting. It has also been determined, both from the improvement in reporting and from personal conferences with physicians that the medical profession prefers to report directly to the state health department. Doctors dislike, especially in small communities, to identify themselves to local boards of health as treaters of gonorrhea and syphilis.

Further analysis of the reports according to sex reveals that, with declining interest, the reporting of female infections falls off much

Table 1. Reported gonorrhea and syphilis in Massachusetts, 1919-1935.

| PERIOD | GONORRHEA | | SYPHILIS | |
|------------------------|-------------|----------------|-------------|----------------|
| | Total Cases | Annual Average | Total Cases | Annual Average |
| 1919 | 9,435 | 9,435 | 4,127 | 4,127 |
| 1920 | 7,225 | 7,225 | 2,987 | 2,987 |
| 1921 | 5,563 | 5,563 | 2,497 | 2,497 |
| 1922-1925 | 20,291 | 5,058 | 8,296 | 2,074 |
| 1926-1928 ¹ | 13,720 | 4,573 | 5,139 | 1,713 |
| 1929 ¹ | 4,410 | 4,410 | 1,531 | 1,531 |
| 1930 | 6,974 | 6,974 | 4,197 | 4,197 |
| 1931-1934 | 27,068 | 6,767 | 17,914 | 4,478 |
| 1935 | 6,193 | 6,193 | 5,317 | 5,317 |

¹Reports to local boards of health, 1926-1929, inclusive. Reports to State Department of Public Health in other years.

Note: 1918 omitted. Data available for only ten months.

| PERIOD | GONORRHEA | | | | SYPHILIS | | | |
|-----------|----------------|--------|------------------------|--------|----------------|--------|------------------------|--------|
| | Annual Average | | Per Cent of 1919 Total | | Annual Average | | Per Cent of 1919 Total | |
| | Male | Female | Male | Female | Male | Female | Male | Female |
| 1919 | 7,331 | 2,104 | 100.0 | 100.0 | 2,423 | 1,704 | 100.0 | 100.0 |
| 1920 | 6,120 | 1,105 | 83.4 | 52.5 | 1,912 | 1,075 | 78.9 | 63.1 |
| 1921-1925 | 4,423 | 748 | 60.3 | 35.6 | 1,462 | 677 | 60.3 | 39.7 |
| 1926-1929 | 3,679 | 853 | 50.2 | 40.6 | 1,035 | 633 | 42.7 | 37.1 |
| 1930-1935 | 5,046 | 1,660 | 68.9 | 78.9 | 2,661 | 1,911 | 109.9 | 112.2 |

Note: 1918 omitted. Data available for only ten months.

Table 2. Reported gonorrhea and syphilis, according to sex, Massachusetts, 1919-1935.

more rapidly than the reporting of male infections. Eventually, however, the two tend to resume a relationship to each other in the ratio of approximately 3 male infections to 1 female infection in the case of gonorrhea, and 3 male infections to 2 female infections in the case of syphilis. (Tables 2 and 3). If the reports for 1919 are used as a base line, reports of gonorrhea in 1920 fell 16.6 per cent for the male and 47.5 per cent for the female. Thereafter, by the end of 1929 (ten years later) reports of gonorrhea in the male had fallen to 47.2 per cent of the 1919 figure, and in the female, to 45.6 per cent. The male-female ratio was 3.48 in 1919, rose to 5.85 in the

Table 3. Ratio of male to female infections with gonorrhea and syphilis, as reported in Massachusetts, 1918-1935.

| PERIOD | GONORRHEA | | SYPHILIS | |
|--|----------------|-------------|----------------|-------------|
| | Annual Average | Male/Female | Annual Average | Male/Female |
| 1918 | 7,681 | 2.72 | 3,284 | 1.45 |
| 1919 | 9,435 | 3.48 | 4,127 | 1.42 |
| 1920 | 7,225 | 5.54 | 2,987 | 1.78 |
| 1921-1925 | 5,171 | 5.85 | 2,139 | 2.16 |
| 1926-1928 | 4,573 | 4.59 | 1,713 | 1.65 |
| 1929 | 4,410 | 3.59 | 1,531 | 1.60 |
| 1930 | 6,974 | 3.02 | 4,197 | 1.43 |
| 1931-1934 | 6,767 | 3.04 | 4,478 | 1.39 |
| 1935 | 6,193 | 3.03 | 5,317 | 1.38 |
| United States Public Health Service Census | - | 2.81 | - | 1.57 |

period 1921 to 1925, and returned to 3.59 in 1929. Since then, with improvement in reporting, reports of female infections increased only slightly faster than those of male infections, and a ratio of 3 to 1 has been maintained.

Exactly the same phenomenon occurred in syphilis reporting. From 1919 to 1920, reports of male infections declined 21.1 per cent and of female infections, 38.9 per cent. By 1929, reports of male infections had fallen to 38.9 per cent of the 1919 figure and of female infections, to 34.5 per cent. The male-female ratio was 1.45 in 1919, rose to 2.16 in the period from 1921 to 1925 and returned to 1.60 in 1929. Since then the ratio has been maintained at about 1.40 to 1. The ratios established by the United States Public Health Service Census agree very closely with those for Massachusetts. They are 2.81 for gonorrhea and 1.57 for syphilis. The population of Massachusetts in 1930 was 51.3 per cent female. That studied in the Census was 49.2 per cent female. It would seem reasonable to conclude that with stabilized interest, whether good or poor, the reported ratio of male to female gonorrhea is approximately 3 to 1 and that for syphilis approximately 3 to 2. With declining interest, reporting of female infections declines more rapidly than reporting of male infections, but with recovery of interest, both sexes are affected almost equally, since the male-female ratio is approximately maintained. It would seem reasonable to conclude, further, that a stable ratio of 3 to 1 in gonorrhea and 3 to 2 in syphilis fairly well represents the ratio in which these diseases are diagnosed, although it may not truly represent the actual ratio of their prevalence in the two sexes.

These ratios deserve further consideration in that they vary for the two diseases. It would appear that for every two females with gonorrhea or syphilis, there are six males with gonorrhea and three with syphilis. For every three males with either gonorrhea or syphilis there will be one female with gonorrhea and two with syphilis. Thus there would seem to exist the paradoxical situation that gonor-

rhea is spread by females twice as frequently as syphilis, but that syphilis is spread by males twice as frequently as gonorrhea. The ratio of male gonorrhea to male syphilis is 1.90 to 1. The ratio of female gonorrhea to female syphilis is 0.87 to 1. Can it be possible that a female with gonorrhea is almost twice as promiscuous as one with syphilis, while a male with syphilis is more than twice as promiscuous as one with gonorrhea? Or is gonorrhea in the female almost twice as communicable as syphilis in the female, while syphilis in the male is more than twice as communicable as gonorrhea in the male? Or is there some factor which prevents the diagnosis and reporting of gonorrhea in the female?

This paradoxical situation exists in each subdivision according to marital status. (Table 4). Although the male-female ratio for either disease varies according to marital status, that for gonorrhea is invariably nearly twice that for syphilis. Single males have gonorrhea four times as frequently as single females; married males have a little more than twice as much gonorrhea as married females and among the widowed, divorced, and separated, the reported prevalence is almost equal in the two sexes. The variation is proportionately the same in syphilis, but the male-female ratio is only half as great as that for gonorrhea, and, except in single females, syphilis is regularly more prevalent in females (according to reports) than gonorrhea.

It is true that Table 4 compares gonorrhea with syphilis in all

Table 4. Ratio of male to female infections with gonorrhea and syphilis, according to marital status, Massachusetts, 1930-1935.

TOTAL CASES: Gonorrhea, 40,235; Syphilis 27,428.

| MARITAL STATUS | MALE/FEMALE | | GONORRHEA/SYPHILIS | |
|------------------------------|----------------------|----------|----------------------|--------|
| | Gonorrhea | Syphilis | Male | Female |
| TOTAL | 3.04 over 1.39 = 2.2 | | 1.90 over 0.87 = 2.2 | |
| Single | 4.02 over 2.07 = 1.9 | | 3.01 over 1.55 = 1.9 | |
| Married | 2.29 over 1.29 = 1.8 | | 1.15 over 0.64 = 1.8 | |
| Widowed, divorced, separated | 1.18 over 0.68 = 1.7 | | 0.81 over 0.47 = 1.7 | |
| Not stated | 2.80 over 1.63 = 1.7 | | 1.45 over 0.85 = 1.7 | |

stages, but if only early (primary and secondary) syphilis is considered, the result, so far as ratios are concerned, is the same. (Table 5). The male-female ratio corresponds with that for total syphilis and the ratio for gonorrhea is about twice that for early syphilis. It appears that early syphilis is reported in the same ratio among the two sexes as late syphilis.

The ratio of male gonorrhea to male early syphilis and that of female gonorrhea to female early syphilis cannot be compared with those in Table 4 which includes all syphilis, since most of the late syphilis is reported in the later age groups and over-weights the distribution among married, widowed, and divorced, and under-weights the distribution among single persons.

It is well known that gonorrhea is hard to diagnose in the female. Syphilis is usually detected serologically and serological procedures are equally available to both sexes, and are used routinely in many clinics and by an increasing number of physicians. Whether the prevalence of syphilis is nearer equality in the two sexes than the ratio of reported infections indicates might be determined by learning whether females present themselves for medical attention (and therefore subject themselves to serological examination) in the same proportion of the general population as males. Two large out-patient services in Boston report new admissions of 6,818 and 29,060 persons respectively. Males accounted for 52.4 per cent and

Table 5. Ratio of male to female infections with gonorrhea and early syphilis, according to marital status, Massachusetts, 1930-1935.

TOTAL CASES: Gonorrhea, 40,235; Early Syphilis¹ 7,861.

| MARITAL STATUS | MALE/FEMALE | | GONORRHEA/EARLY SYPHILIS | |
|------------------------------|-------------|-----------------|--------------------------|-----------------|
| | Gonorrhea | Early Syphilis | Male | Female |
| TOTAL | 3.04 | over 1.49 = 2.0 | 6.44 | over 3.15 = 2.0 |
| Single | 4.02 | over 2.31 = 1.7 | 7.62 | over 4.38 = 1.7 |
| Married | 2.29 | over 1.15 = 2.0 | 5.27 | over 2.65 = 2.0 |
| Widowed, divorced, separated | 1.18 | over 0.61 = 1.9 | 3.85 | over 2.00 = 1.9 |
| Not stated | 2.80 | over 1.56 = 1.8 | 4.64 | over 2.58 = 1.8 |

¹Primary and secondary.

51.1 per cent of the totals respectively. Males make up only 48.7 per cent of the population of the State. Thus, in two hospitals, the male admission rate is somewhat higher than that for females. However, admissions to prenatal clinics and maternity services may well make up the difference, since neither of the two hospitals reporting has such services.

There is no diagnostic procedure for gonorrhea equal to serological tests for syphilis. Clinically, gonorrhea is far more obvious in the male than in the female, and therefore more readily suspected. Smears are easier to collect properly from the male urethral meatus than from the cervix and Skene's glands. Since diagnosis of gonorrhea is rarely made unless it is supported by "positive" smears, it is safe to conclude that only a small proportion of the gonococcal infections in the female are ever diagnosed or reported.

There is nothing in the epidemiology of gonorrhea which can account for the high male-female ratio as compared with the lower ratio for syphilis. As a matter of fact, it is probable that gonorrhea is communicable longer than syphilis because there is no effective sterilizing agent for that disease as there is for syphilis. Further, syphilis becomes less communicable with time, owing to the healing of the open early lesions, while gonorrhea is communicable as long as the gonococcus persists in the secretions and discharges of the genito-urinary tract. If the facts were known, it is likely that the prevalence of gonorrhea in the female would be found to have the same relationship to its prevalence in the male as female syphilis has to male syphilis. If that is so, there is room for progress in the detection of gonorrhea in the female.

This apparent deficiency in the reporting of gonorrhea in the female must affect analysis of the reports in other directions to some extent, if failure to make the diagnosis, or to report, is more likely to occur in case of infections in the married than in the single, or in the older than in the younger age groups, for instance. It is probable that leucorrheas or other genito-urinary symptomatology

in the older, married women are more frequently ascribed to non-specific conditions than in younger, single women, when a correct diagnosis would be gonorrhea. In that case, the following analyses will be conservative so far as they point to the innocent infection of married women, but will overemphasize the prevalence of the disease among the younger, single women. It is also possible that some of the infections in divorced and separated women were acquired in marriage. Gonococcal vulvovaginitis in girl children is very likely overemphasized because most vulvovaginitis is diagnosed as gonococcal although, on careful study, much of it proves to be nonspecific.

The distribution of gonorrhea according to sex and age is presented in six three-year periods. (Table 6). It is remarkably similar in all of them, whether reporting was good or poor, except that

Table 6. Reported gonorrhea, according to sex and age, Massachusetts, 1918-1935.

| PERIOD | 0-4 YEARS | 5-9 YEARS | 10-14 YEARS | 15-19 YEARS | 20-24 YEARS | 25-29 YEARS | 30-34 YEARS | 35-44 YEARS | 45+ YEARS | TOTAL |
|---------------------------|--------------|--------------|----------------|----------------|----------------|----------------|----------------|----------------|--------------|-------|
| PER CENT OF TOTAL MALE | | | | | | | | | | |
| TOTAL | 0.2 | 0.1 | 0.3 | 9.0 | 34.1 | 25.3 | 14.0 | 12.4 | 4.6 | 100.0 |
| 1918-1920 | 0.2 | 0.2 | 0.3 | 9.9 | 36.3 | 24.9 | 13.2 | 11.0 | 4.0 | 100.0 |
| 1921-1923 | 0.1 | 0.1 | 0.1 | 9.1 | 36.4 | 26.5 | 13.6 | 10.5 | 3.6 | 100.0 |
| 1924-1926 | 0.05 | 0.1 | 0.3 | 9.1 | 35.7 | 26.1 | 13.3 | 11.3 | 4.05 | 100.0 |
| 1927-1929 | 0.1 | 0.1 | 0.5 | 10.3 | 33.4 | 24.2 | 14.0 | 12.5 | 4.9 | 100.0 |
| 1930-1932 | 0.5 | 0.1 | 0.3 | 8.1 | 32.2 | 24.7 | 14.4 | 14.3 | 5.4 | 100.0 |
| 1933-1935 | 0.3 | 0.1 | 0.2 | 7.9 | 30.4 | 25.0 | 15.3 | 14.7 | 6.1 | 100.0 |
| PER CENT OF TOTAL FEMALE | | | | | | | | | | |
| TOTAL | 3.5 | 4.6 | 2.7 | 20.5 | 30.2 | 17.2 | 9.4 | 8.2 | 3.7 | 100.0 |
| 1918-1920 | 2.9 | 3.6 | 3.3 | 22.3 | 31.9 | 16.4 | 8.6 | 7.8 | 3.2 | 100.0 |
| 1921-1923 | 4.1 | 4.7 | 3.6 | 20.4 | 32.6 | 18.5 | 7.5 | 6.0 | 2.6 | 100.0 |
| 1924-1926 | 2.6 | 4.1 | 2.2 | 24.2 | 30.5 | 16.1 | 9.9 | 7.2 | 3.2 | 100.0 |
| 1927-1929 | 3.8 | 5.0 | 3.1 | 21.4 | 28.4 | 16.9 | 9.6 | 8.1 | 3.7 | 100.0 |
| 1930-1932 | 4.0 | 5.3 | 2.1 | 19.3 | 29.2 | 17.5 | 10.1 | 8.5 | 4.0 | 100.0 |
| 1933-1935 | 3.4 | 4.6 | 2.3 | 17.6 | 29.1 | 18.0 | 10.1 | 9.9 | 5.0 | 100.0 |
| 1930 Male Population | 4.18 | 4.65 | 4.58 | 4.26 | 3.83 | 3.61 | 3.62 | 7.32 | 12.69 | 48.7 |
| 1930 Female Population | 4.05 | 4.54 | 4.53 | 4.36 | 4.29 | 4.02 | 3.94 | 7.55 | 13.98 | 51.3 |

there appears to be a progressive decrease in the 15 to 24 year age group in both sexes, with scattered increases in the later age groups. There has been no corresponding shift in population, in fact in some of the age groups the shift of population has been opposite to that in the distribution of gonorrhea. Are young people avoiding infection? Are they becoming more inclined to neglect medical attention? Or are proportionately more infections being diagnosed in the later age groups?

The peak of reported prevalence in the male is in the 20-24 year age group, at 34.1 per cent, and in the female is in the same age group at 30.2 per cent. In the 15-19 year group, the male 9.0 per cent is less than half the female 20.5 per cent. In the group under 15 years of age, males account for only 0.6 per cent of male infections while females in that group account for 10.8 per cent of all female infections. Apparently the epidemiologic factor which operates in the spread of gonorrhea in girls under 15 years of age does not operate to the infection of males in that age group. It would seem that these infections in young girls are not the result of exposures between the sexes of that age group, but must occur as a result of exposure to adult infections and perhaps, in part, to exposures within their own sex and age group.

Nearly 44 per cent of the infections in males are in the group under 25 years of age and 69 per cent in those under 30 years of age. The female acquires gonorrhea earlier than the male, for over 61 per cent of the infections are in women under 25 years of age and nearly 79 per cent are in those under 30. If the "innocent" infections in young girls are excluded entirely from consideration, these figures become 56.8 per cent and 76.1 per cent, respectively, and the peak, between 20 and 24 years of age, becomes 33.9 per cent.

Compared with the distribution of early syphilis (Table 7) that of gonorrhea has an earlier peak. The influence of the greater prevalence of gonorrhea is noted in these higher peaks in the younger age groups. The sex life of a person who is to be infected must be

longer on the basis of chance, to acquire the less prevalent syphilis than to acquire the more prevalent gonorrhea. The closer agreement between female gonorrhea and female syphilis in these age groups may be due to the fact that both diseases are so frequently acquired by the female immediately after marriage, or it may be more apparent than real due to the failure to diagnose (or report) gonorrhea in that sex.

The curve for primary syphilis follows that for gonorrhea more closely than does that for total early syphilis. Secondary syphilis, being diagnosed several weeks or months later than primary syphilis, affects the distribution according to age.

It is interesting to compare Tables 7 and 8. The curve of first marriages has its peak in the same age group as those of gonorrhea and primary syphilis, in both male and female. When these tables are compared with Table 9 it becomes apparent that both diseases are frequently carried into marriage by the male. The distribution of gonorrhea in females over 14 years of age is almost the same as that of primary syphilis, according to marital status. In the male,

Table 7. Reported early syphilis,¹ according to sex and age, Massachusetts, 1930-1935.²

TOTAL CASES: Male, 4,700; Female, 3,160. Primary Syphilis Only: Male, 2,135; Female, 574.

| AGE GROUPS | EARLY SYPHILIS PER CENT OF TOTAL | | PRIMARY SYPHILIS ONLY PER CENT OF TOTAL | |
|------------|-------------------------------------|--------|--|--------|
| | Male | Female | Male | Female |
| TOTAL | 100.0 | 100.0 | 100.0 | 100.0 |
| 0-4 | 0.09 | 0.3 | 0.05 | 0.17 |
| 5-9 | 0.06 | 0.3 | 0.05 | 0.9 |
| 10-14 | 0.3 | 0.6 | 0.1 | 0.5 |
| 15-19 | 3.8 | 12.5 | 4.6 | 14.1 |
| 20-24 | 22.2 | 29.2 | 23.2 | 33.8 |
| 25-29 | 23.2 | 21.9 | 24.4 | 21.1 |
| 30-34 | 17.0 | 14.5 | 17.1 | 12.9 |
| 35-44 | 22.2 | 14.1 | 20.6 | 11.1 |
| 45+ | 11.4 | 6.6 | 9.9 | 5.4 |

¹Primary and secondary.

²Not reported by stage prior to 1930.

| YEAR | FIRST MARRIAGE | UNDER 20 YEARS | 20-24 YEARS | 25-29 YEARS | 30-34 YEARS | 35-44 YEARS | 45+ YEARS | TOTAL |
|--------------------------|----------------|----------------|-------------|-------------|-------------|-------------|-----------|-------|
| PER CENT OF TOTAL MALE | | | | | | | | |
| 1919 | 27,539 | 3.5 | 39.2 | 35.2 | 13.8 | 6.9 | 1.3 | 100.0 |
| 1925 | 25,643 | 3.7 | 40.2 | 34.7 | 13.4 | 6.8 | 1.2 | 100.0 |
| 1931 | 21,757 | 3.5 | 41.2 | 34.2 | 13.4 | 6.5 | 1.3 | 100.0 |
| PER CENT OF TOTAL FEMALE | | | | | | | | |
| 1919 | 27,539 | 19.2 | 46.4 | 23.4 | 7.2 | 3.4 | 0.4 | 100.0 |
| 1925 | 25,643 | 22.1 | 45.4 | 22.2 | 6.7 | 3.0 | 0.5 | 100.0 |
| 1931 | 21,757 | 21.6 | 47.3 | 21.6 | 6.5 | 2.6 | 0.4 | 100.0 |

Table 8. Age at first marriage, Massachusetts, 1919-1931.

also, the curves are reasonably similar. As reported, between 60 and 70 per cent of infections in the male are in single men whereas only from 40 to 50 per cent of those in the female are in single females. The high proportion of infected widowed, divorced, and separated women probably is partly accounted for by infections which occurred in marriage. Undoubtedly many infections in the male first come to medical attention after marriage and are reported as in married men. Undoubtedly, also, many infections in recently married women are never diagnosed for what they really are nor reported as such. Probably the percentage of single males and of married females should be higher than the reports indicate, although actual statistical proof that this is so is lacking.

Table 9. Reported gonorrhea and syphilis according to sex and marital status (per cent). Massachusetts, 1930-1935.

| MARITAL STATUS | GONORRHEA | | | | EARLY SYPHILIS ¹ | | PRIMARY SYPHILIS | |
|------------------------------|-----------|---------------|--------|---------------|-----------------------------|--------|------------------|--------|
| | Male | | Female | | Male | Female | Male | Female |
| | Total | Over 14 Years | Total | Over 14 Years | | | | |
| TOTAL | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Single | 65.8 | 65.5 | 49.8 | 43.8 | 55.7 | 35.9 | 60.8 | 43.8 |
| Married | 26.7 | 26.9 | 35.5 | 39.8 | 32.7 | 42.3 | 27.6 | 38.4 |
| Widowed, divorced, separated | 4.3 | 4.4 | 11.2 | 12.5 | 7.2 | 17.6 | 6.6 | 13.3 |
| Not stated | 3.2 | 3.2 | 3.5 | 3.9 | 4.4 | 4.2 | 5.0 | 4.5 |

¹Primary and secondary.

SUMMARY

Health officials and agencies are urged not to continue in the present tendency to lose interest in the control of gonorrhea. Although it has not been dramatized as syphilis has, there is enough of drama and tragedy in gonorrhea to make its control of the utmost importance to the public health. It is far more prevalent than syphilis. Now that the American Neisserian Medical Society has been organized for the study of and improvement of the management of gonorrhea, it is important that health official and physician combine to work for its control.

Since March 1, 1918, the Massachusetts Department of Public Health has collected 108,560 reports of gonorrhea and 55,289 of syphilis. These reports are analysed and show:

That whether reporting is good or poor depends directly upon the extent to which the medical profession is interested in the problem. Reporting was good under the stimulus of war-time enthusiasm, was poor during the early post-war period when the Department maintained no active program, and has since improved under the stimulus of an active program. It is also indicated that reporting is better when reports are made directly to the Department than when they are made to local boards of health.

That with declining interest, reports of female infections fall off very rapidly, whether of gonorrhea or syphilis, but that eventually reports of male infections also fall off until a male-female ratio of approximately 3 to 1 for gonorrhea and of 3 to 2 for syphilis is maintained. These ratios are approximated when reporting is good and when poor reporting has become stabilized. Almost the same ratios are reported in the United States Public Health Service Census of gonorrhea and syphilis. It is concluded that these ratios represent approximately those in which the two diseases are diagnosed as between male and female. Since this makes it appear that syphilis is spread by males twice as frequently as gonorrhea while gonorrhea is spread by females twice as frequently as syphilis, it is concluded

that gonorrhea is more often missed than diagnosed in the female. This paradoxical situation is discovered to exist when the reports are studied according to marital status as well or when gonorrhea is compared to early or to late syphilis.

The distribution of gonorrhea according to sex and age over six three-year periods is remarkably similar whether reporting was good or poor, except that there appears to be a progressive decrease in the 15-24 year age group which is taken up by the older age groups. The peak of reported prevalence in the male is in the 20-24 year age group, at 34.1 per cent and in the same age group in the female at 30.2 per cent. Females under 15 years of age account for 10.8 per cent of all female infections, but males of that age group account for only 0.6 per cent of male infections. Males under 30 account for 69 per cent of male infections and females under 30 account for 79 per cent of female infections.

Gonorrhea reaches an earlier and higher peak in percentage distribution by age than syphilis. On the basis of chance, the sex life of a person must be longer to acquire the less prevalent syphilis than the more prevalent gonorrhea. The peaks are closer in the female than in the male, which may be due to the fact that both diseases are acquired by many females immediately after marriage, or to the failure to diagnose most infections with gonorrhea in that sex.

The curve of first marriages has its peak in the same age group as gonorrhea and syphilis in both sexes. This is significant in view of the fact that, as reported, between 60 and 70 per cent of infections in the male are in single men and only from 40 to 50 per cent of infections in the female are in single females. Some of the large number of infections reported in widowed, divorced, and separated females are probably acquired in marriage. Undoubtedly many male infections first come to medical attention after marriage and many infections in newly married females are never diagnosed as gonococcal. It is probable that the percentage of single males and married females should be higher than the reports indicate.

MEASURING HEALTH NEEDS IN AN URBAN DISTRICT

by DOROTHY G. WIEHL

III. ILLNESS AND THE EXTENT OF MEDICAL CARE¹

PROMOTION of the health of the poor and less privileged residents of a district is dependent on adequate facilities for the treatment of illness and physical conditions requiring medical care as much as on a well-functioning public health program. The educational and preventive services of the latter cannot be fully effective unless the medical care needed is readily available. Although the house-to-house survey of families in the Mott Haven Health District of New York City was conducted primarily to reveal their status with respect to the preventive health services being provided, the visit to the families gave an opportunity to determine also the prevalence of serious illness; the extent to which these illnesses had received medical care; and what had been the source of any medical care received. Failure to obtain medical attention for illness is not necessarily due to lack of clinic and hospital facilities but results also from ignorance of need; indifference arising from improper understanding of its importance; attitudes toward the use of public or charity services; overcrowding in the clinics with its resultant delays, long waiting, and impersonal attention to the individual which discourages revisits and continued medical attention. The present study does not provide information concerning the reasons for not securing medical care, but indicates only for a series of illnesses the extent to which some medical advice had been secured, through private, charity, or public facilities.

¹ From the Milbank Memorial Fund. This is the third in a series of papers reporting on a survey of 1,049 families in the Mott Haven district, the Bronx, New York City, which was made in 1932 before a district health organization was established there. The first and second papers describing the survey and reporting on the public health services rendered were published in the January and April issues of the *Quarterly*, 1936, xiv, No. 1, pp. 23-36, and No. 2, pp. 144-162.

MEDICAL FACILITIES

Within the Mott Haven district² there is one general city hospital (425 beds) and one general private hospital (154 beds), both of which maintain a large out-patient department for nearly every type of medical care; and a private general hospital (450 beds) with no out-patient department. There is also a city hospital for infectious diseases and tuberculosis; a private tuberculosis hospital; and a small hospital for eye, ear, nose, and throat treatment. All, except the infectious disease hospital, are located in the central part of the district and are easily accessible to the most populous sections.

Many other hospitals outside the district boundaries are comparatively short distances from the district. One large general city hospital is only a few blocks from the northern boundary and many hospitals in the upper end of Manhattan can be reached quickly by one of the rapid transit lines.

DESCRIPTION OF DATA

The 1,049 families in the survey were all visited once by the same investigator some time between June and December, 1932. A complete roster of the family with sex and age of each member, and a record of the approximate income of the family and of the rental paid during the preceding twelve months was obtained.³ The data on illness utilized in this report are based on the informant's statement concerning illnesses in the family during the previous twelve months and the medical and nursing care received. For medical care, a record was taken as to whether it had been obtained from a private physician, a hospital clinic, or other agency, and also as to whether the patient had been in a hospital during the past year either as a private patient or ward patient. In the case of ward

² The Mott Haven Health District had a population of 232,000 in 1930, according to the Federal Census.

³ The Mott Haven district is one of the low-rental neighborhoods of New York City and the 1930 Census showed only 28 per cent of the families paying \$50 or more for monthly rental. The survey sample was found to be reasonably typical of the 75 to 85 per cent of families in the district who paid less than \$50 for rent in 1932. (See first article in this series.)

patients, no information was obtained concerning payment for hospital services. No data were obtained concerning the number of visits to clinic or physician or number of days in the hospital.

Before presenting some of the results of this phase of the survey, it is important to consider the limitations of the data. The remembered illnesses for a period as long as a year are admittedly an incomplete record. The completeness with which cases are reported may be expected to vary for different types of illnesses; for example, most of the prolonged and serious illnesses and the chronic conditions, if they have caused some disability during the year will be recalled; and, it is believed that the children's communicable diseases are remembered fairly accurately. On the other hand, many minor illnesses, such as colds and digestive upsets, are forgotten and the chance of their being remembered depends on how long before the enumerator's visit the illness occurred.⁴

The significance of the record of illnesses, therefore, is not as an indication of the actual prevalence or incidence of illness in the district, although for some causes, especially chronic conditions, the reported incidence gives some interesting indications as to the health of the group surveyed. The data concerning the medical attention given to various types of illness and the extent to which the population of the district depended upon free and part-pay medical services give a factual basis for some appraisal of the problem of medical service. It is essentially a study of conditions within the district and only limited comparisons can be made with those revealed by surveys in other areas.

⁴In a discussion of morbidity statistics, Sydenstricker wrote: "Experience has shown that the completeness of a record of illness depends upon at least three important conditions. One is its severity and nature; the second is the length of the period for which the informant is asked to report; the third is the subjectivity of the record itself. Nearly every adult will remember an illness due to typhoid fever incident upon himself or in his family if it took place within the preceding ten or twenty years; few will recall a brief illness due to a common cold unless it occurred within a very short period immediately preceding the date of inquiry. Illnesses of a minor kind are observed and remembered when incident upon the informant himself with a greater degree of completeness than when incident upon others, even in the same family." Sydenstricker, Edgar: *Statistics of Morbidity*. The Milbank Memorial Fund *Quarterly Bulletin*, April, 1932, x, No. 2, p. 107.

ILLNESS REPORTED

Of the 1,049 families in the survey, 595, or 56.7 per cent, reported one or more illnesses during the year; approximately one-half (283 families) reported only one illness; and 45 families, or 7.6 per cent of those with some illness, reported 5 to 13 cases. The number of individuals for whom an illness was reported was 1,049, or 22.6 per cent of the 4,649 persons in the survey. These individuals were sick an average of 1.2 times during the year and the number of illnesses⁵ reported for each individual was:

| Number of Illnesses Reported for One Year | Number of Persons | Per Cent Sick Specified Times |
|--|----------------------|----------------------------------|
| 1 | 898 | 85.6 |
| 2 | 120 | 11.4 |
| 3 | 28 | 2.7 |
| 4 | 2 | .2 |
| 5 | 1 | .1 |

The 1,235 illnesses reported give a total annual case rate of 269.6 per 1,000 persons.⁶ The incompleteness of these reports as an indication of the total amount of illness during the year is suggested by a comparison with the reported incidence obtained by repeated visits to families at short intervals of time during a year. In the Hagerstown survey,⁷ an annual incidence of 1,080 illnesses per

⁵ A continuous period of sickness was counted as one illness in most cases, regardless of the number of diagnoses or symptoms mentioned. The dates of onset and termination were not definite for many acute illnesses and when sickness from unrelated conditions was reported, each condition was counted an illness even though no interval of time between their occurrence was indicated. Thus, a case of measles and whooping cough in the same child and overlapping in time would be counted as two illnesses; but a case of whooping cough and pneumonia was counted as a single illness. For chronic conditions which were not continuously disabling but which were given as the cause of some illness during the year, no definite record of separate attacks or periods of disability was obtained and the chronic condition is counted as one illness; acute conditions occurring in persons suffering some chronic ailment were counted as illnesses as well as the chronic condition. In case of illness with more than one diagnosis, the *primary* cause to which the illness was allocated was that designated by the *MANUAL OF JOINT CAUSES OF DEATH*, Bureau of the Census, 1925.

⁶ The rate is based on 4,588 person years. Most of the population included was reported on for the entire year, but an adjustment for months of life under observation was made for infants.

⁷ Sydenstricker, Edgar: *A Study of Illness in a General Population Group*. *Public Health Reports*, United States Public Health Service, September 24, 1926. Reprint 1113, p. 12.

1,000 was reported and in the extensive surveys of illness made by the research staff of the Committee on the Costs of Medical Care an annual case rate of 850 per 1,000 was reported.⁸

The reported sickness rate was found to be only slightly lower than that reported from a survey made in Winchester, Massachusetts, one of the towns which comprise metropolitan Boston, in which the same technique was followed; that is, on a single visit, the informant was asked to report illnesses occurring within the past year. In the Winchester survey,⁹ the reported morbidity was 407 per 1,000 persons and when this rate is adjusted to the age distribution of the population observed in the Mott Haven district, the rate is 376 compared with an annual rate of 270 reported for Mott Haven. However, as the Winchester survey was made in the spring and the elapsed time was relatively short between the visit and winter months when respiratory illnesses are frequent, the rate for minor respiratory illness was more than twice as high as in the Mott Haven survey, although the rate for pneumonia was somewhat higher in Mott Haven. If the excess in the minor respiratory rate in Winchester is deducted from the total, an adjusted rate of 292 per 1,000 is obtained. Thus, with the seasonal difference removed, the two surveys yielded essentially the same results.

Causes of Illness. An analysis of the frequency of certain specific illnesses of a more serious nature and of chronic ailments in the population reveals some interesting indications as to the health of the group surveyed.¹⁰ The illness rates for a few selected diseases are shown in Table 1, and some comparisons made with the findings of the extensive periodic surveys reported on by Collins and

⁸ Collins, Selwyn D.: Causes of Illness in 9,000 Families Based on Nation-wide Periodic Canvasses, 1928-1931. *Public Health Reports*, United States Public Health Service, March 24, 1933, 48, No. 12, pp. 283-308. Data are for rural communities and cities of all sizes in eighteen states.

⁹ Lombard, Herbert L.: A Sickness Survey of Winchester, Massachusetts. *American Journal of Public Health*, September, 1928, xviii, No. 9, pp. 1089-1097.

¹⁰ All tabulations of illness from specific causes relate only to the population surveyed which had been resident one year or longer in Mott Haven district.

those in the Winchester report. In the Mott Haven survey and the Winchester study, the diagnosis reported by the patient was not verified by a physician, but in the periodic surveys a physician had checked the diagnosis for about one-half of the illnesses. Lower rates in both Mott Haven and Winchester for illnesses for which medical diagnosis is necessary might be the result of the patient's lack of knowledge concerning the real cause.

Pneumonia, cancer, rheumatism, and nervous breakdowns or general nervousness were reported as of about equal prevalence in Mott Haven and in the average experience for the eighteen states in the periodic surveys. Tuberculosis, appendicitis, and liver and gall bladder conditions were only from 52 to 68 per cent as frequent in Mott Haven as in the general survey. It seems very probable that

Table 1. Annual illness rates for selected diseases. Rates reported for a twelve-month period by families in the Mott Haven district visited once only, June-December, 1932, compared with rates obtained by same method in Winchester, Massachusetts, and those obtained by periodic canvasses during a twelve-month period in eighteen different states.

| CAUSE OF ILLNESS | ANNUAL CASE RATE PER 1,000 ¹ | | | RATIO OF RATES IN MOTT HAVEN TO | |
|---|---|----------------------|--|------------------------------------|-------------------|
| | Mott Haven | Winchester, Mass. | General Survey with Periodic Canvasses | Winchester | General Survey |
| Pneumonia | 7.0 | 5.8 | 7.0 | 1.21 | 1.00 |
| Tuberculosis (all forms) | 2.3 | 1.2 | 3.4 | 1.92 | .68 |
| Cancer | 1.4 | 1.3 | 1.4 | 1.08 | 1.00 |
| Rheumatism | 9.2 | 20.8 | 10.2 | .44 | .90 |
| Diabetes | 1.4 | 1.3 | 1.8 | 1.08 | .78 |
| Nervousness and nervous break- down | 8.5 | a | 8.7 | a | .98 |
| Heart diseases | 9.9 | 13.1 | 7.4 | .76 | 1.34 |
| Varicose veins | 2.5 | a | 1.2 | a | 2.08 |
| High blood pressure and arteriosclerosis | 5.4 | 5.4 | 3.4 | 1.00 | 1.59 |
| Appendicitis | 4.5 | a | 8.4 | a | .54 |
| Hernia and intestinal obstruction | 3.4 | a | 2.6 | a | 1.31 |
| Liver and gall bladder conditions | 3.4 | a | 6.5 | a | .52 |
| Number of person years | 3,549 | 9,746 | 38,544 | | |

^aNot reported on for comparable diagnoses.

¹The age distribution of persons in the General Survey was very similar to that in Mott Haven but in Winchester the percentage of persons 45 years of age and older was much higher than in Mott Haven (about 27 per cent compared with 16.2).

the low rates from these conditions reflect a neglect of medical attention for ill health and symptoms associated with them more than an unusually low incidence of the diseases.¹¹ Both heart diseases and high blood pressure, including arteriosclerosis, were reported as more prevalent in Mott Haven than in the general survey population.

The comparative rates shown in Table 1 for selected diseases provide rather strong evidence that the reporting of serious illnesses and chronic conditions was nearly complete in the Mott Haven study, although the minor and acute illnesses represent only a small percentage of the total illnesses of this type.

EXTENT OF MEDICAL CARE

Some type of medical attention was reported for 852, or 69 per cent, of the illnesses. The type of care is shown in Table 2. Forty per cent of all illnesses and 58 per cent of those with care had been attended by a private physician. Among the cases seen at some time by a private physician, 13 per cent also had free or part-pay care at a clinic or as a ward patient in a hospital. The total number of hospitalized cases was 224, or 18 per cent of all illnesses reported and 26

Table 2. Medical care reported for the 1,235 cases of illness in families surveyed in Mott Haven district, June-December, 1932.

| TYPE OF MEDICAL CARE RECEIVED | PER CENT OF ILLNESSES WITH SPECIFIED CARE | PER CENT OF ATTENDED CASES WITH SPECIFIED TYPE OF CARE | NUMBER OF CASES ATTENDED |
|---|---|--|--------------------------|
| ANY MEDICAL CARE | 69.0 | 100.0 | 852 |
| Private physician only ¹ | 34.7 | 50.2 | 428 |
| Private physician and clinic ² | 5.3 | 7.7 | 66 |
| Free and part-pay service only | 29.0 | 42.0 | 358 |
| Hospital | 18.1 | 26.3 | 224 |
| Private patient | 2.8 | 4.1 | 35 |
| Ward patient | 15.3 | 22.2 | 189 |

¹Includes all private patients in a hospital.

²Includes free and part-pay service, either in-patient or out-patient.

¹¹ The annual death rate from tuberculosis in the Mott Haven district was 70 per 100,000 population in the three-year period 1929-1931, compared with 71.5 in the Registration Area of the United States in 1930.

per cent of the cases which had any care. Only 15.6 per cent of the hospital cases, or about 1 out of 6, were private patients.

Comparison with Other Surveys. The proportion of cases with any medical care was somewhat smaller in Mott Haven than in Winchester in 1927 where a physician had attended 78 per cent of all illnesses reported; and the difference would be greater if an adjustment were made for the relatively high percentage of minor respiratory illnesses in the Winchester total. The extent of medical care in Mott Haven was quite similar to that reported for low-income families in the periodic surveys of the Committee on the Costs of Medical Care¹² for which the percentage of illnesses attended was 66.5 in families with less than \$1,200, 75 in families with \$1,200 to \$2,000, and 80.4 for families with \$2,000 to \$3,000. However, since the proportion of serious and disabling illness was much higher in the Mott Haven study, the general indication is that medical care was obtained for fewer illnesses of this type in Mott Haven in 1932 than would be expected from the average experience in eighteen states in 1928-1931.

Groups of wage-earners in seven cities which were surveyed in the spring of 1933 by the United States Public Health Service in cooperation with the Milbank Memorial Fund comprised a population very similar in character to that in the Mott Haven study. Medical care was obtained for only 52 per cent of the cases of sickness reported for a three-month period in these families;¹³ but physicians had attended 67 per cent of the disabling illnesses which are

¹² Falk, I. S.; Klem, Margaret C.; and Sinai, Nathan: *INCIDENCE OF ILLNESS AND COSTS OF MEDICAL CARE AMONG FAMILY GROUPS*. Publication of the Committee on the Costs of Medical Care, No. 26. Chicago, Illinois, The University of Chicago Press, 1933, page 282.

¹³ Perrott, G. St. J.: Sydenstricker, Edgar; and Collins, Selwyn D.: *Medical Care during the Depression*. The Milbank Memorial Fund *Quarterly*, April, 1934, xii, No. 2, pp. 269-284.

Although the records of illness in the two surveys are not strictly comparable, both have a higher percentage of chronic and long duration illnesses than is typical of annual rates based on periodic canvasses. On the other hand, because of the season in which the survey in the seven cities was made, the illnesses from respiratory conditions probably comprise a larger percentage of the total cases than in the Mott Haven survey. The total illness rate for three months in the seven cities was 237 and the disabling illness rate was 141 compared with the annual rate of 270 in Mott Haven.

more nearly comparable to the cases remembered in the Mott Haven study.

More directly comparable are the rates for hospital illness in these various surveys, since it seems reasonable to assume that practically all hospitalized illnesses were remembered for the Mott Haven population. The 224 cases give an annual hospital illness rate of 48 per 1,000 persons. This is only a little more than one-half the annual hospital rate for low-income families in cities over 100,000 population in the Committee on the Costs of Medical Care survey.¹⁴

Using the hospital case rate per 1,000 persons for three months in the seven large cities, an approximate annual rate of 72 per 1,000 persons was estimated.¹⁵ The reported rate for Mott Haven was only two-thirds of this estimated rate. Both these data and that from the Committee on the Costs of Medical Care survey suggest that the amount of illness receiving hospital care was relatively low in the Mott Haven district.

Sources of Medical Care. When medical attention was obtained from other than private physicians, an inquiry was made as to what hospital or clinic provided care. As about 20 per cent of the families in the survey had lived in the Mott Haven district less than one year and some of the illnesses in these families had occurred in other parts of the City, the agency providing care is shown in Table 3 in the Mott Haven district.

There were forty-four different institutions or public agencies named by the informants as having given treatment for 259 illnesses; but only seven¹⁶ had treated 10 or more illnesses and these

¹⁴ *Op. cit.*, page 113. If the rates for hospitalized cases per 1,000 persons in families with incomes of under \$1,200 and \$1,200 to \$2,000 are weighted according to the approximate proportions in the Mott Haven sample with these incomes, the average rate is about 83.

¹⁵ The rate for cases hospitalized less than the entire three months during the late winter and early spring period of observation was assumed to equal 25 per cent of the year's rate, since, although this is a period of high sickness rates, monthly admissions to a large general hospital for a corresponding three-month period were found to equal 25 per cent of the year's total in two successive years.

¹⁶ These seven hospitals included three general City hospitals in the Bronx, a private general hospital in the Mott Haven district, the Presbyterian Medical Center, Mt. Sinai Hospital, and the Hospital for Joint Diseases.

had cared for 190 cases or about three-fourths of the total. Nearly half of the institutions (20) had cared for only one case, these being usually special hospitals, such as tuberculosis sanatoria, maternity hospitals, and mental disease hospitals, or hospitals for special groups, such as veterans. Eleven patients had received treatment at two different institutions for the same illness, and one had been to three different institutions.

Only 51 per cent of the illnesses receiving free or part-pay care had had attention at any of the five hospitals or a Department of Health clinic within the Mott Haven district. Another 17 per cent had received treatment at one of the two general City hospitals in the Bronx Borough, outside the district. City institutions had cared for 150 illnesses, or 58 per cent of those having some type of free medical care from a known institution. This group also constituted 17 per cent of all reported illnesses and 24 per cent of those which had received any medical attention.

Nursing Care. Bedside care by a visiting nurse was provided by the Henry Street Nursing Service for twenty-two illnesses reported,

Table 3. Type and location of institutions which provided free or part-pay medical care for 259 illnesses reported by families residing one year or longer in Mott Haven district, 1931-1932.

| TYPE AND LOCATION OF INSTITUTION | NUMBER OF CASES TREATED ¹ | PER CENT OF CASES TREATED AT SPECIFIED INSTITUTION ¹ |
|---|--|---|
| Total cases with free or part-pay care | 259 | 100.0 |
| Total cared for in district institution | 131 | 50.6 |
| City hospitals | 79 | 30.5 |
| Private hospitals | 45 | 17.4 |
| Health Department clinic | 7 | 2.7 |
| Bronx, outside of district | 46 | 17.8 |
| City hospitals | 44 | 17.0 |
| Private hospital | 2 | .8 |
| Other City hospitals | 20 | 7.7 |
| Other private hospitals | 69 | 26.6 |
| Federal institutions | 5 | 1.9 |
| State institutions | 1 | .4 |

¹Cases treated by more than one agency or institution are counted for each institution; therefore, numbers treated in specified institutions do not total to the number of cases cared for.

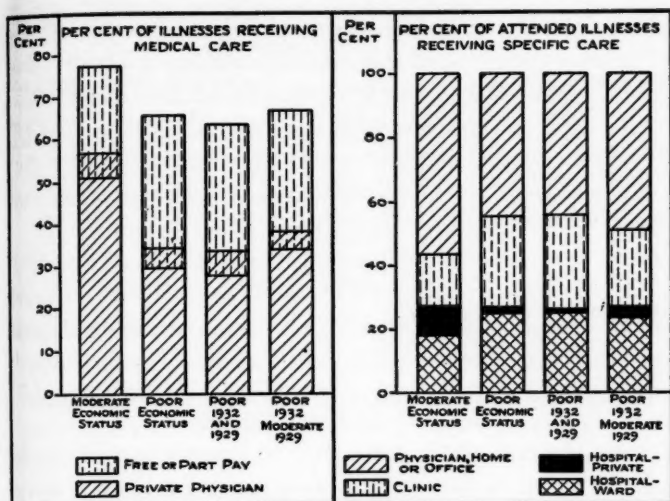


Fig. 1. Economic status and medical care. Percentages of reported illnesses attended by a private physician or by a clinic physician and, for classes with medial attendance, the percentages receiving different types of medical care according to economic status of families surveyed in Mott Haven district, 1932. (In classification by type of care, cases have been counted only once, the preference given being in the following order: ward patient in hospital, private patient in hospital, out-patient clinic care, private patient not hospitalized.)

or for 2.7 per cent of all cases, exclusive of confinements. In addition, nursing service to twenty-one maternity cases was reported, and, when these are included, the forty-three cases attended by Henry Street nurses are 4.8 per cent of all reported illness.

Only three families among the 801 which had been resident in Mott Haven district for one year or longer had employed a registered nurse to care for an illness at home. The three illnesses given private nursing care in the home are 0.4 per cent of the reported cases.

Economic Status and Medical Care. In families of moderate income (estimated annual income of \$1,400 or more), 77 per cent of the cases of sickness had had some medical attention during the year compared with 66 per cent of illnesses in families of lower

| TYPE OF MEDICAL CARE | PER CENT OF ILLNESSES RECEIVING SPECIFIED MEDICAL CARE FOR DIFFERENT INCOME GROUPS | | | | |
|--------------------------|---|----------------------------|-----------------------------------|--------------------|--------------------------------|
| | All Incomes ¹ | Moderate Income 1932 | Poor for 12 Months' Survey Period | | |
| | | | Total ² | Moderate Before | Poor Also in Previous Years |
| ANY MEDICAL CARE | 69.0 | 77.2 | 65.8 | 67.0 | 63.6 |
| Private physician | 40.0 | 56.8 | 34.4 | 38.0 | 33.5 |
| Clinic, free or part-pay | 34.3 | 26.1 | 36.1 | 33.0 | 35.8 |
| Hospital cases | 18.1 | 21.6 | 18.0 | 18.4 | 17.1 |
| Private | 2.8 | 7.9 | 1.4 | 2.3 | 1.0 |
| Free or part-pay | 15.3 | 13.7 | 16.6 | 16.1 | 16.1 |
| Number of illnesses | 1,235 | 241 | 837 | 342 | 316 |

¹Includes families of unknown income.

²Includes families "poor" in survey year for which the income in previous years was unknown.

Table 4. Medical attendance according to family income for illnesses reported in 1,049 families surveyed in Mott Haven district, June-December, 1932.

incomes. The ratio of the percentage of illnesses attended in the moderate group to that for the poor group is 117. This is almost identical with the proportionate difference between the high-income families and the poor in the survey of wage-earners' families in seven large cities for which the percentages of illnesses attended were 58 and 50 in the upper income group and lowest, respectively.¹⁷

The type of medical care received showed a greater variation according to the income of the family than the total percentages of illnesses which were attended by a physician. In Figure 1 and Table 4, the medical attention and type of care are shown for several income groups. In families of moderate income, a private or family physician attended 57 per cent of the cases of illness compared with 34 per cent in poor families; in other words about one in two cases in families of moderate income and about one in three cases in the "poor" families had seen a private physician. Some free or part-pay care was obtained for 26 per cent of illnesses in families of moderate income, and for 36 per cent in poor families. The hospital rate was

¹⁷ *Op. cit.*, page 8. The families in the seven cities were classified on a per capita basis, and families with \$425 per capita or more have been taken as approximately comparable with those in Mott Haven with an annual income of \$1,400 or more.

20 per cent higher in moderate income families than in poor families; but the proportion of cases seen by a physician which were hospitalized was about equal in the two income groups (Table 5). There is reasonable evidence, therefore, that the higher rate for medical attendance in the moderate income families was not due to seeking care for a larger number of minor illnesses.

The families classified as "poor" were subdivided into two groups, those having been in the same income class for several years and those whose income had dropped to less than \$1,400 since 1929. It will be noted in Table 4, that the families which had recently become "poor" received a little more medical attention than the "chronic poor" and that they had care from their private physician more often and attended the hospital clinics less frequently. The differences in medical care are slight, however, for the two groups of "poor" families and both had less medical attention than the moderate income group.

Table 5. Distribution according to type of care of illnesses with medical attention in families of different incomes surveyed in Mott Haven district, June-December, 1932.

| TYPE OF MEDICAL CARE | ALL INCOMES ¹ | INCOME GROUPS | | | |
|---|--------------------------|---------------|-------------------------|-----------------------|-------------------------------|
| | | Moderate | Total Poor ² | Poor 1932 and Earlier | Poor 1932 Previously Moderate |
| TOTAL CASES WITH MEDICAL CARE | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Free or part-pay care, total | 49.8 | 33.9 | 54.8 | 56.2 | 49.3 |
| Out-patient | 27.6 | 16.1 | 29.6 | 30.8 | 25.3 |
| In hospital | 22.2 | 17.8 | 25.2 | 25.4 | 24.0 |
| Private physician cases only | 50.2 | 66.1 | 45.2 | 43.8 | 50.7 |
| At home | 46.1 | 55.9 | 43.0 | 42.3 | 47.2 |
| In hospital | 4.1 | 10.2 | 2.2 | 1.5 | 3.5 |
| Both private and clinic care ³ | 7.8 | 7.6 | 7.0 | 9.0 | 6.1 |
| Out-patient | 5.2 | 5.4 | 4.5 | 6.5 | 4.4 |
| In hospital | 2.6 | 2.2 | 2.5 | 2.5 | 1.7 |
| Number of cases with any care | 852 | 186 | 551 | 201 | 219 |

¹Includes illnesses in families of unknown income.

²Includes illnesses in families classified as "poor" in 1932 but with unknown income in earlier years.

³These per cents are included in totals for clinic cases, out-patient and in hospital.

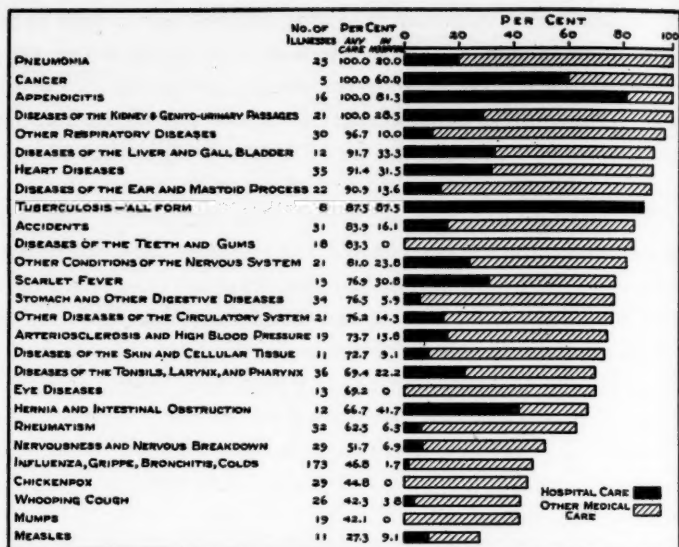


Fig. 2. Illness from specific causes and medical attendance. Per cent of illnesses from a selected list of causes for which some medical care and hospital care one day or longer was reported by families in the Mott Haven district surveyed in 1932.

Cause of Illness and Medical Attendance. Of greater significance in considering medical attendance is to take illness resulting from specific diseases. Just which cases or what types of illness ought to be cared for by a physician is a question about which opinions may differ and no evaluation of this will be attempted. The data are presented for twenty-seven categories in Figure 2, which shows the per cent of the cases of each type for which one or more visits to a physician or clinic were made and the per cent which was hospitalized for one day or longer during the year. These twenty-seven categories include 87 per cent of the total number of cases, exclusive of confinements.

Many of the conditions for which the rate of medical attendance was from 90 to 100 per cent could not have been specifically classified by the informant had the patient not had medical care. In

| CAUSE OF ILLNESS | PER CENT OF ILLNESSES ATTENDED | | NUMBER OF ILLNESSES REPORTED | |
|--|--------------------------------|----------|------------------------------|----------|
| | Mott Haven | C.C.M.C. | Mott Haven | C.C.M.C. |
| Minor respiratory diseases ¹ | 49.0 | 64.4 | 202 | 11,444 |
| Accidents | 83.9 | 90.0 | 31 | 2,869 |
| Measles | 27.3 | 65.3 | 11 | 926 |
| Whooping cough | 42.3 | 72.0 | 26 | 737 |
| Diseases of the ear and mastoid process | 90.9 | 93.5 | 22 | 723 |
| Diseases of the kidney, bladder, and annexa | 100.0 | 95.8 | 12 | 518 |
| Diseases of the heart and arteries | 85.2 | 95.3 | 54 | 443 |
| Rheumatism | 62.5 | 87.9 | 32 | 397 |
| Appendicitis | 100.0 | 97.8 | 16 | 325 |
| Pneumonia | 100.0 | 100.0 | 25 | 268 |
| Diseases of the liver and gallbladder ² | 91.7 | 91.8 | 12 | 208 |
| Hernia and intestinal obstruction | 66.7 | 90.1 | 12 | 101 |
| Cancer | 100.0 | 97.9 | 5 | 48 |

¹A few cases of sinusitis and chronic bronchitis are included in Mott Haven data, but not in Committee on the Costs of Medical Care.

²Diseases of liver not included in Committee on the Costs of Medical Care data.

Table 6. Medical attendance for illness from specific causes in low-income families resident one year or longer in Mott Haven district compared with the average experience for families of all incomes in eighteen different states canvassed for the Committee on the Costs of Medical Care.

other words, there may well have been other cases of cancer, appendicitis, gall bladder diseases, etc., which were included under more general classifications or ill-defined causes because there had been no medical care. Only about one-half of the persons suffering from nervousness or nervous breakdown had seen a physician during the year, and less than half of the respiratory illnesses reported as influenza, grippe, bronchitis, colds and coughs, and of the communicable diseases of childhood, except scarlet fever, had been attended.

For a few specific causes and groups of causes, it is possible to compare the medical care in Mott Haven with that reported for the average experience of the population in the Committee on the Costs of Medical Care survey.¹⁸ The comparative percentages are in Table 6. The medical attendance rate for minor respiratory illnesses, for rheumatism, hernia and intestinal obstruction, and for measles and whooping cough was definitely lower in Mott Haven,

¹⁸ *Op. cit.*, page 71.

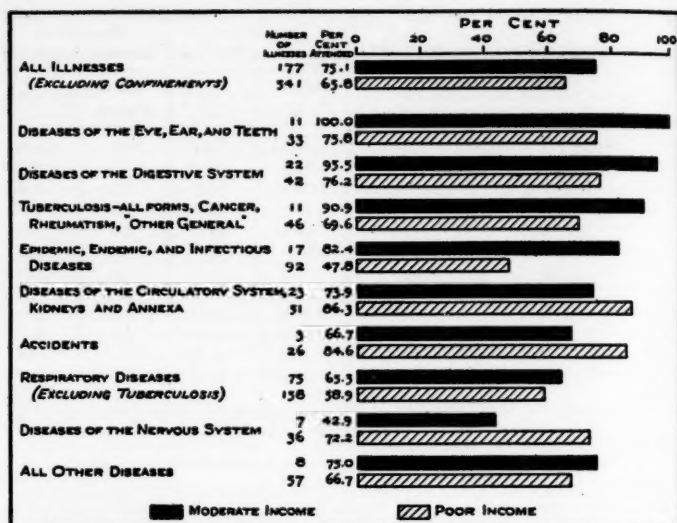


Fig. 3. Economic status and medical care for broad classes of illness. Per cent of illness classified into broad categories for which some medical attendance was reported by families in two income groups surveyed in the Mott Haven district in 1932.

but for organic and chronic illness and the few serious acute types shown, such as appendicitis and pneumonia, there was no significant difference.

It is of interest to note for what types of illness the economic status of the family was more likely to influence the question of medical attendance. For broad categories of the diseases, a comparison of the percentages of illnesses attended in families of moderate and poor economic status is shown in Figure 3. The proportion attended was higher in the families of moderate income than in poor families for nearly all types of illness, but for diseases of the circulatory system, kidneys and annexa, and for diseases of the nervous system, the percentage with medical care during the year of record was lower for persons of moderate income.¹⁹ The differ-

¹⁹ The percentage of accidents with medical attendance in moderate income families also was lower than in poor families, but only three accidents were reported in the higher income group and the percentage has no significance.

ence in the extent of medical care for respiratory illness according to income of the family was very slight. The greatest difference in medical attendance was for epidemic and infectious diseases; 82 per cent of the illnesses from these diseases in moderate income families had been seen by a physician and only 48 per cent in poor families.

Only very broad indications concerning the adequacy of medical service in the Mott Haven district are afforded by this study. Which cases or how many were in need of medical care cannot be determined. When the relatively high proportion of serious and disabling illnesses in the total is considered, the percentage of cases with medical attention appears to be somewhat lower than previous studies indicate as average experience; and for a list of specific diseases, the medical attendance rate was lower than that found in the studies made by the Committee on the Costs of Medical Care except for diseases for which medical diagnosis is a factor in identifying the cause of illness. Hospitalization of illness was found to be especially low compared with other urban communities.

Lack of income was associated with the failure to obtain medical care, especially in the case of acute conditions; persons with diseases of an organic nature were attended at least as frequently in "poor" families as in those with slightly higher incomes.

The low-income families surveyed in the district, representing at least 75 per cent of the total population, used public medical facilities very extensively. One-half of the illnesses which received any care had had some part-pay or free care.

THE FREQUENCY OF CITY HEALTH DEPARTMENT SERVICES FOR INFANTS¹

AN ANALYSIS OF THE INTERVAL OF TIME BETWEEN INFANT VISITS IN HOME OR CLINIC FOR HEALTH DEPARTMENT SERVICES IN BELLEVUE-YORKVILLE DISTRICT OF NEW YORK CITY

by RUTH L. LEWIS

HOW often an infant should be seen by a public health nurse or a clinic physician is a question that cannot be answered specifically. In practice, standards for frequency of health supervision are set up as administrative guides which, in general, are the basis of recommendations for return visits; although special problems in the family, social or economic, and poor health make more intensive services to some babies advisable. This paper presents an analysis of 1,049 infant visits in the Bellevue-Yorkville district of New York City according to the interval of time between visits and according to any reasons for service recorded which seemed to influence the frequency of supervision. It provides a quantitative picture of the amount of service given in more detail and from a point of view not available from the usual tabulations of clinic and nursing service. It also shows to what extent the mothers brought the babies to the clinic and the nurses visited the homes in accordance with the established standard.

A previous report² discussed the health supervision given by the Health Department and by private agencies to a group of 779 infants born in this area between July 1, 1931 and June 30, 1932.³ For the special analysis presented here, which supplements the earlier report, the records of 56 infants were picked at ran-

¹ From the Milbank Memorial Fund.

² Randall, M. G.: Public Health Nursing Service for Infants. *Milbank Memorial Fund Quarterly*, April, 1935, xiii, No. 2, p. 185.

³ The data were from a special investigation of all births in the Bellevue-Yorkville district except those to families living in high-rental apartment houses. Very few of the families in the survey had as much as \$2,000 a year and one-fourth of the fathers were unemployed the entire year.

dom⁴ from those for all infants who had attended a Health Department clinic. These infants had 1,049 contacts⁵ in home and clinic, giving a total of 993 intervals.⁶

Health Department Standard for Frequency of Service. The *Manual of Instructions* for the New York City Department of Health nurses states that: "Babies under one year of age should be supervised in the home or the clinic every two weeks, but preferably in the clinic so that the babies may be weighed." The clinic physician has the responsibility of giving appointments for an early return to clinic if there is a special problem, and the nurse has the responsibility of maintaining clinic attendance and of making at least one visit to the home to check up on general conditions. Other visits to the home are governed largely by the clinic attendance of the infant, since frequent home visits are unnecessary when adequate clinic attendance is being maintained.

Home Visits. The 169 home visits made by the nurses represent 16 per cent of the total 1,049 Health Department contacts. Seventy per cent of the infants were visited at least once after clinic attendance in order to check on general conditions in the home. Nearly three-fourths of these visits were made in less than two weeks after registration. Over one-half of the infants not receiving a routine check-up in the home had been visited previous to clinic registration. Thus, a check was made on general home conditions for 88 per cent of the infants. After these visits are made there is seldom any need to revisit unless the child is irregular in clinic attendance or unless there is a special problem which the nurse can take care of more satisfactorily in the home.

⁴ The average number of clinic visits made by these infants was 15 per year, approximately the same as for the whole group, for which the average was 14 visits.

⁵ The word "contact" in this paper is used to refer to service given the infant either in the home or in clinic.

⁶ Since frequency of service is being shown in terms of the interval of time that elapsed between any two successive contacts with the infant by the Health Department, there is one less interval for each infant than the number of visits, on which to base this study of the frequency of service.

Since the need for further home visiting depends largely on the lack of clinic supervision of the infant, the nurse would consider clinic attendance in her decision as to whether a home visit is required. That she has done so is shown by the fact that 65 per cent of the remaining home visits were made to infants who were either not attending clinic at all or were irregular in their attendance. Adequate clinic attendance was being maintained at the time that 35 per cent of the home visits were made. While there may have been reasons that were not recorded for these home visits, an analysis such as this may focus attention on the advisability of questioning the need for some of these visits.⁷

Interval of Time between Clinic Visits. The intervals between visits to a Health Department clinic portray the frequency of nearly all actual supervision, since, as shown above, the home visits by the nurse were very few and were supplementary to the clinic supervision, especially to maintain regular clinic attendance.

Table 1 shows the visits to clinic that occurred in each specified interval of time. Eleven per cent of the visits were made in intervals of less than one week, 46 per cent from one week to less than two weeks, and 23 per cent at intervals of two weeks to less than three weeks. For 6 per cent of the visits a month elapsed,

Table 1. Interval of time between visits to Health Department well-baby clinic in Bellevue-Yorkville, New York City.

| Interval of Time Between Clinic Visits | Visits Made to Well- Baby Clinic in Each Interval of Time | |
|---|---|----------|
| | Number | Per Cent |
| ANY INTERVAL | 802 ¹ | 100.0 |
| Less than 1 week | 90 | 11.2 |
| 1 week but less than 2 weeks | 367 | 45.8 |
| 2 weeks but less than 3 weeks | 182 | 22.7 |
| 3 weeks but less than 1 month | 81 | 10.1 |
| 1 month but less than 2 months | 52 | 6.5 |
| 2 or more months | 30 | 3.7 |

¹ In addition to these there were 22 visits for which no return visit was made.

⁷ In a previous study, *op. cit.*, it was shown that for a sample of infants in low-income families, 26 per cent received no home visits during the first year of life from the Health Department nurses.

and for 4 per cent two or more months passed before the next clinic attendance. In other words, 57 per cent of the visits to clinic were made in less than two weeks, and 20 per cent were made in three weeks or more.

While the routine policy calls for a visit to clinic every two weeks, there were only 90 clinic visits for which a definite date to return was noted on the clinic record. These were nearly all in connection with a revisit for some special need, and frequently the return date was earlier than the usual two weeks. For example, weekly visits were required for diphtheria immunization;⁸ a return in three days was necessary for the reading of a tuberculin test; and, if the mother arrived too late to see the doctor on one visit, she might have been told to come back in a few days. Seventy of the appointments were for intervals of less than two weeks, and 74 per cent of these were kept. Apparently when a definite appointment was made and the mother understood the importance of keeping the appointment, she usually cooperated.

The reasons why clinic visits for which no appointment date was recorded were made sooner or later than the routine two weeks' interval are classified in Table 2, according to information on the clinic records. For the largest group of the early visits with recorded reasons (28 per cent), the visit was made because of some slight illness—cold, red throat, and the like—and the mother returned to clinic for advice. Even though the Health Department clinics are primarily for well babies, they examine infants brought in by the mother, if necessary refer them to agencies that give service for illness, and sometimes make the arrangements with these agencies for the infant's care. The health education of the mother includes teaching the symptoms which indicate the need for special advice concerning her baby, and it is natural that she depends on the clinic to give her that advice and

⁸ At the time these data were collected, three doses of toxin-antitoxin were being given for diphtheria immunization.

assistance. From this angle it seems that illness may be considered an adequate reason for early supervision.

For 14 per cent of the "early" visits, the purpose was stated as "weighing" but the records did not carry sufficiently detailed information to indicate the necessity for weighing every few days, as occurred for some infants.

For 56 per cent of the "early" visits, no reason was recorded. The nurse would probably be able to supply this information if she were using this type of analysis for evaluating her own work. She might be surprised to find that a small group of mothers had formed the habit of returning with their babies to clinic every week or less, when no particular problem was involved.

For the visits that occurred in intervals of over two weeks, few reasons were given for the delay. In some instances, supervision

Table 2. Reasons for visits to Health Department well-baby clinic made in intervals of less than two weeks, and for those made in intervals of more than two weeks, when no definite appointment was recorded. Bellevue-Yorkville district, New York City.

| TIME AND REASON FOR CLINIC VISIT | CLINIC VISITS IN EACH SPECIFIED CLASSIFICATION | |
|---|--|--------------|
| | Number | Per Cent |
| CLINIC VISITS IN LESS THAN TWO WEEKS | 391 | 100.0 |
| Reason Recorded | | |
| Illness | 108 | 27.6 |
| Weighing | 56 | 14.3 |
| Examination not made on previous visit | 5 | 1.3 |
| Formula or nutrition problem | 4 | 1.0 |
| No reason recorded | 218 | 55.8 |
| CLINIC VISITS IN OVER TWO WEEKS | 194 | 100.0 |
| Reason Recorded | | |
| Care given by another agency | 5 | 2.6 |
| Out of town for a short period | 1 | 0.5 |
| Home visits made by nurse | 2 | 1.0 |
| Illness—not able to attend clinic | 1 | 0.5 |
| Mother unable to come to clinic | 1 | 0.5 |
| No reason recorded | 184 | 94.9 |

was being given by other agencies, and in a very few instances the infant was temporarily away from the district. But for 95 per cent of the visits that were made in intervals of over two weeks, no reason was recorded for the delay in regular supervision.

Relation of Problems to Frequency of Clinic Visits. It seems advisable to consider the problems noted for each of the clinic visits, since the severity or nature of these problems should determine the need for more or less frequent service than the bi-monthly attendance suggested. From the information given on the clinic records, the problems have been classified in three groups: (1) *major problems*—those which might necessitate an early return to clinic (which includes all illnesses, nutrition when there is a definite formula problem or the child is classed as malnourished or overweight, a defect when an immediate correction was advised or when a service could be rendered in clinic regarding a defect, such as strapping a hernia, and an economic problem in which the mother was told to return to clinic for cod-liver oil, clothes, etc.); (2) *minor problems*—those not requiring an early return (all problems which would not fall in the first group); and (3) no problems noted on the clinic record. As shown in

Table 3. Comparison of the interval of time between visits to Health Department well-baby clinic according to the severity of problems recorded for the previous clinic visit. Bellevue-Yorkville district, New York City.

| CLASSIFICATION OF PROBLEMS | INTERVAL OF TIME BETWEEN VISITS TO CLINIC | | | | | |
|----------------------------------|---|------------------------|----------------------|-----------------|------------------------|----------------------|
| | Any Interval | Less Than Two Weeks | Two Weeks or More | Any Interval | Less Than Two Weeks | Two Weeks or More |
| | Number | | | Per Cent | | |
| ANY PROBLEM | 802 | 457 | 345 | 100.0 | 57.0 | 43.0 |
| Major problems (Group 1) | 306 | 202 | 104 | 100.0 | 66.0 | 34.0 |
| Minor problems (Group 2) | 381 | 193 | 188 | 100.0 | 50.7 | 49.3 |
| No problems (Group 3) | 115 | 62 | 53 | 100.0 | 53.9 | 46.1 |

Table 3, more severe problems seem to have a slight influence on early attendance at clinic. Two-thirds of the visits with major problems occurred in less than two weeks as compared with one-half of

the visits with minor problems.

Interval of Time between Health Department Services. A composite picture of all services given 56 infants in the first year of life is shown by an analysis of the clinic and home vis-

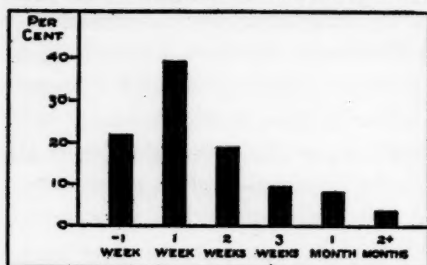


Fig. 1. Interval of time between clinic or home nursing services to infants in the Bellevue-Yorkville health district.

its combined. The distribution of intervals of time between these contacts with a Health Department physician or nurse is shown in Figure 1. For 21 per cent of the visits (made in home or clinic) there was a time interval of less than a week before the next visit; for 39 per cent of the visits, the interval was from one week to less than two weeks; and for 19 per cent, the interval was two weeks but less than three weeks. Nine per cent of the visits showed a lapse of three weeks to one month, 8 per cent a lapse of a month, and for 3 per cent the interval of time was two months or more. Thus, for more than half of the visits, there was an interval of less than the standard, or two weeks.

Reasons for "early" visits were found on the records for over one-half of all "early" visits. As shown in Table 4, 19 per cent of the "early" supervision was due to illness and the next largest group (11 per cent) to early attendance at clinic for the purpose of weighing. For 43 per cent of these "early" visits there was no reason or special problem recorded.

Although the amount of services specified in the Health Department standard for frequency of infant supervision in New York City exceeds that of many urban centers, it is evident that

| REASONS FOR SERVICES | SERVICES GIVEN FOR EACH SPECIFIED REASON | |
|---|--|----------|
| | Number | Per Cent |
| TOTAL SERVICES | 599 | 100.0 |
| Clinic appointment | 52 | 8.7 |
| Clinic following home visit | 52 | 8.7 |
| Illness | 115 | 19.2 |
| Weighing in clinic | 64 | 10.7 |
| Routine visit in home following clinic | 34 | 5.7 |
| Repeated home visits for clinic delinquency | 8 | 1.3 |
| Formula, economic or other problem in home | 10 | 1.7 |
| Visiting others in family | 5 | 0.8 |
| No reason recorded | 259 | 43.2 |

Table 4. Reasons for services given to infants at intervals of less than two weeks by the New York City Health Department in Bellevue-Yorkville district.

some mothers sought and received an unusual amount of service. In order to cope with this problem and to make a fair distribution of services to all infants in the district who need it, an occasional analysis of the actual practice would assist in determining what changes of policy are necessary to make the most effective use of available services. The nurse, through her knowledge of family situations and health problems of the infant, could determine which mothers were making unnecessary visits and could analyze also some of the reasons for delayed revisits. More attention to giving definite appointments for the next visit and some special attention to those mothers who attend irregularly might improve the regularity of supervision.

THE DEVELOPMENT OF SYSTEMATIC TRAINING IN RURAL PUBLIC HEALTH WORK IN CHINA¹

by C. C. CH'EN, M.D. M.P.H.²

THE Ting Hsien system of health organization is known to every province of the country. A great deal has been published about the principles and methods of the system and to indicate the results to be expected elsewhere. It seems that the demonstrative stage of the work is over and any district which budgets 10 cents per capita for health will find it profitable to adopt the Ting Hsien system. The lack in many districts, Kiangning, Nanch'i, and Chouping, to mention a few, is for personnel to put the Ting Hsien system into practice. From the first of this year it was, therefore, deemed essential to transform the demonstration concept of the Division to that of training, and the activities of the Division were regulated to meet the requirements for training. The Health Center and the eight subdistrict health stations, however, continued to function. Their activities may be summarized as follows:

Vital Statistics. Since the number of village health workers at the end of 1934 had increased from 27 to 80, the number of registering villages was suddenly tripled. The population in the registration area was 103,087. There were 2,667 births and 2,997 deaths reported by the eighty workers and one city inspector. The crude birth rate was 25.9 and the crude death rate was 29.1. The lower figure for the birth rate is due to incomplete reporting, because the ratio of male to female births is found to be 58.2 to 41.8. In the experimental area, with a population of 13,800, where registration has been carried on for the last four years, the number of births reported this year was 433 and the rate practically the same as last year, i.e., 32.0. The

¹ With some editorial revision, this is the annual report of the Department of Public Health of Ting Hsien, China, for 1935.

² Head, Division of Public Health, Chinese National Association of the Mass Education Movement, Ting Hsien, Hopei, China. This Division has received financial and technical assistance from the Milbank Memorial Fund since 1929.

death rate of the same area was 36 in 1935 as against 18 in 1934, because of epidemics of scarlet fever and dysentery among children.

The infant mortality for the year was 185.2 per 1,000 births. This

Table 1. Age distribution of deaths reported in Ting Hsien, 1935.

| Age | Number of Deaths | Percentage |
|-------------|------------------|------------|
| TOTAL | 2,997 | 100.00 |
| 0-1 | 494 | 16.48 |
| 1-4 | 839 | 28.01 |
| 5-9 | 308 | 10.28 |
| 10-14 | 83 | 2.77 |
| 15-19 | 60 | 2.00 |
| 20-24 | 74 | 2.47 |
| 25-29 | 66 | 2.20 |
| 30-34 | 73 | 2.44 |
| 35-39 | 40 | 1.33 |
| 40-44 | 57 | 1.90 |
| 45-49 | 48 | 1.60 |
| 50-54 | 112 | 3.74 |
| 55-59 | 64 | 2.14 |
| 60-64 | 139 | 4.64 |
| 65-69 | 110 | 3.67 |
| 70-74 | 171 | 5.70 |
| 75-79 | 90 | 3.00 |
| 80-89 | 144 | 4.80 |
| 90 and over | 25 | 0.83 |

has not shown marked changes in the last few years. It is to be noted that the deaths before the age of five make up 44.49 per cent of all deaths. (Table 1).

Smallpox remained one of the lowest causes of mortality, and there was no rabies reported this year, but the astonishingly high rates of scarlet fever and dysentery and infant diarrhoea deserve special attention. (Table 2).

The coincidence of a lowered rate of puerperal conditions with that of tetanus neonatorum seems interesting. The increasing percentage of deliveries by trained midwives in the City of Tingsien, from 1.3 per cent in 1930, 9 per cent in 1933, and 8.1 per cent in 1934, to 13.6 per cent in 1935, may be a factor in this. The educational influence of maternal work is probably more far-reaching than the actual amount of practical work done by a single midwife.

Among the 321 deaths that occurred in the City the percentage of patients attended by modern physicians before death dropped from 35.8 per cent in 1934 to 24.0 per cent this year. The reason is twofold. First, the chief causes of mortality during the year, scarlet fever and gastro-intestinal infections, come under the category of internal medicine. Nowhere in the country has the public developed

confidence in scientific methods of treatment in internal medicine. Second, the suspension of the Missionary Hospital in the suburb of the City leaves the Health Division the only agency practising scientific medicine in the district. The actual number of patients receiving modern care before death was 77—over 85 per cent of the figure for 1934. This means, disregarding the unusual conditions of epidemics, that the Health Division really rendered over 80 per cent of all the modern medical care obtainable in the City. As a whole, the availability of modern care to the population, at least as shown by conditions in the City, seems to be on the increase and the amount of medical relief rendered further substantiates this belief.

Medical Relief. There were 626 patients admitted to the hospital in 1935, with a total of 10,537 days of hospitalization. Compared with last year, there was an increase of 111 inpatients and of 2,782 patient days. 259 operations, including three cases of laparotomy, were performed with no mortality from the operation.

The clinics of the eight subdistrict health stations treated 15,483

Table 2. Deaths from twenty-seven specific causes in Ting Hsien, per 100,000 population, 1935.

| Cause of Death | Specific Death Rate per 100,000 Population |
|--|--|
| Typhoid fever | 25 |
| Typhus fever | 1 |
| Dysentery | 230 |
| Smallpox | 10 |
| Plague | 0 |
| Cholera | 11 |
| Diphtheria | 55 |
| Epidemic cerebral meningitis | 9 |
| Scarlet fever | 653 |
| Measles | 61 |
| Purulent infections | 74 |
| Rabies | 0 |
| Other infectious and parasitic diseases | 104 |
| Convulsions | 111 |
| Puerperal conditions | 23 |
| Tuberculosis of the respiratory system | 178 |
| Tuberculosis of other organs | 46 |
| Respiratory diseases | 154 |
| Diarrhoea and enteritis (under 2 years) | 200 |
| Diseases of the digestive system not otherwise specified | 157 |
| Cardorenal diseases | 149 |
| Senility and apoplexy | 318 |
| Congenital debility and premature births | 39 |
| Poisoning and suicide | 19 |
| External causes | 28 |
| Other causes | 89 |
| Ill defined causes | 107 |

new patients, with a total attendance of 67,989. Compared with last year, there was an increase of 26,060 treatments given by the stations. In spite of lack of figures to confirm it, the general impression at the stations is that people are calling upon the clinics for medical relief much earlier in the illness than hitherto. Over 40 per cent of the patients referred to the hospital by station physicians carried out the advice given; and over 25 per cent of the patients at the station clinics were referred by the village health workers.

In 1932, when village health workers were first appointed, they gave 4,109 first-aid treatments, and this was considered encouraging. This year the village health workers gave 137,138 treatments without affecting the attendance at the station clinics. This shows that the hundreds of villagers who needed the 137,138 treatments would have received no attention of any kind if there were no such agent as the village worker, and over 25 per cent of the poor villagers who were advised to visit the stations would never have come to the attention of training physicians if these workers were not giving first-aid treatment.

As far as quantity is concerned, there seems no doubt that the present organization has worked very satisfactorily. The degree of penetration into the general population is increasing every day. The experience of the last four years indicates that the village health workers have done more than technical workers could have done with ten times as much money as these lay workers have had. The confidence of the villagers in the simple procedures as carried out by the lay workers goes beyond ordinary belief. In one village the local community supplies its village health worker with soap, towel, and basin for washing hands. In another village the people collected money to buy a bicycle for the worker to maintain connections with the health station. Technically, vaccinations against smallpox, cholera, and even diphtheria have become much easier in the villages where there is a health worker, and the number of cases for medical relief that were referred to health stations and the Center was also

higher from villages with workers than from those without. It is undoubtedly true that without enlisting the lay assistance of these workers, the influence of the technical personnel would never have penetrated into as many villages as it has done here, and a steady flow of medical knowledge into the life of the villagers would have been a mere dream. On the other hand, the workers are not yet in a position to demonstrate principles of hygiene to their neighbors. Removal of this defect would require a prolonged period of training to cultivate desirable attitudes and habits. Accordingly, a special course of training for those village workers who have to some extent won confidence in their villages will be started next fall.

Selection, Training, and Supervision of Laymen: Village Health Workers. Successful utilization of lay workers depends upon special techniques in selection, training, and supervision. Since the Alumni Associations of the People's Schools were the most powerful community organization in Ting Hsien, they were utilized to select the village health workers. The results were always good, with a few exceptions where the community organization itself was poor. The duration of training was sometimes a point of dispute, but experience has shown that the period should not exceed ten days. In these ten days the volunteers come to the health station every day, thus eliminating the cost of group lodging in a central location, and the village organization pays for one meal at noon time for each man trained. If the period is prolonged, the cost of lodging and food would become a problem for an ordinary village. Furthermore, within the limit of the prescribed practice, a period of ten days was found to be enough for explanation, the subsequent supervised practice forming an integral part of the training process.

The supervision is undertaken by the station physician visiting the workers at regular intervals and by workers reporting to the station once a week. The moral aspect, presenting the more difficult problem with volunteer workers, is controlled by public opinion in each village. Special means also have to be devised to influ-

ence the families of the workers so that the latter may feel free to serve the community. We have found, for instance, that it is important to give health workers "Words of Praise" from the magistrate, in addition to a small annual "bonus" which is graded according to definite standards.

Key Position of Subdistrict Health Stations. Subdistrict health stations occupy the key position in the entire system of organized practice, inasmuch as the village health workers depend upon these stations for training and supervision. As a matter of fact, it has been found that the success of the workers is very closely related to the quality of the respective stations, and where there is an energetic subdistrict physician there are good village health workers. Moreover, the extension of preventive work depends almost entirely on the stations, because only there is the opportunity for continuous contact with the villagers. Last year 80 per cent of the vaccinations against smallpox and over 70 per cent of those against cholera were made possible only through the stations. Even from the point of view of medical relief, about 50 per cent of the patients in the hospital of the Health Center today were referred by the stations, and the number of treatments given in these stations far exceeds in influence those given at the Center.

Although one station with the assistance of village health workers may take care of 30,000 population, and every area of 30,000 population should have a station, it is doubtful whether this standard can be reached in this generation as it does not seem practicable to establish them in small villages. From the standpoint of horizontal social approach, the subdistrict health stations may best be compared with the ch'ü government in hsien administration and higher primary schools in general education. To ensure cooperation between these social organizations, it is also preferable to locate the health stations in large market centers where ch'ü³ government and higher primary schools are to be found. Therefore, for practical

³Ting Hsien is divided into five ch'ü (subdistricts).

purposes, one station in each ch'ü would be a reasonable objective for fifteen years.⁴

For the personnel of each station, a physician, and a lay helper are enough to supervise the village health workers and conduct general medical relief and immunization work. The initiation of school health activities would require an additional nurse. Under the present financial conditions, it is improbable that the health organization of a subdistrict can accommodate more than a physician, a nurse, and an attendant. This minimum set-up in a subdistrict will serve as the connecting link between the lowest form of practice in individual villages and the highest type in a district health center.

The quality of service at the stations is most difficult of all to ascertain. It is a direct reflection of basic training in medicine. Inasmuch as the medical schools in this country have no uniform standard, it is impossible to expect a uniform quality of service. Besides, the training in provincial schools is so poor that fundamental practices of cleanliness, asepsis, and simple diagnostic procedures become somewhat unreliable in the hands of their graduates. Various means for improving the training of station physicians have been adopted, such as rotating service in the hospital under strict supervision, weekly morning conferences in the Health Center, and occasional visits of senior physicians to the stations. All of these measures have proved their value, and experience with them has led us to institute an organized course of training.

Excessive importation of drugs has been a point of criticism of scientific medicine by nationalistic economists. After three years of experience one may say that the station physicians are getting used to a standard set of fifty drugs for everyday use. The same principle has been adopted, though to a lesser degree, in the hospital of the Health Center. As a result, it was possible this year to reduce to \$1,938⁵ the cost of all the chemicals for the medical relief carried out

⁴ Ch'ü population would average considerably more than 30,000.

⁵ All cost figures are based on Chinese currency, which is approximately one-third the value of United States currency.

in the district. Of this amount, about \$150 was used for the purchase of alcohol and the same amount for neoarsphenamine, leaving the cost of annual consumption of drugs in the district pharmacy about \$1,600 for the year. Taking half of the sum, \$800, for the hospital, the cost per patient per day would not have exceeded 20 cents for drugs. As to the other half, the degree of economy is even more striking. With \$800 worth of drugs for about 220,000 treatments, each treatment costs about 0.3 cent. Yet even an observant visitor in Ting Hsien may hardly be aware of the practice of economy, as essential drugs for daily use are always available.

The diagnostic laboratory of the Health Center made about 7,000 examinations of blood, sputum, urine, stool, and secretions, including over 200 Kahn tests. The cost per examination per specimen was about 10 cents.

Sanitation and Control of Communicable Diseases. The lack of competent technical assistance, plus the prevailing economic backwardness, has prevented us from making much progress in sanitation. Practical work this year was limited to cultivating sanitation consciousness in the people by working through the village health workers and the primary schools. Thirteen village health workers reconstructed their drinking wells according to our approved design. Out of sixty-seven drinking wells in the schools, thirty-four were remodelled by the end of the year. Compared with the needs of the population, the amount of improvement in schools and in the homes of village health workers is insignificant; but the fact that they do accept our advice and take the trouble to make some improvement has educational value in itself.

An experiment was started this year in training technical personnel. A civil engineer has been engaged in becoming familiar with rural problems and has been attached to health stations to work on minor sanitary devices. In 1936 he may be sent to Nanking for an introductory course in sanitary engineering. After another period of field practice, he may be sent to work under experienced workers,

so that he will become competent to work out technical solutions for the sanitary problems of rural China.

Two more bath houses in addition to the one at the Center were built this year with the cooperation of the local people at Li-Ch'ing-Ku and Hsi-Chien-Yang. The three bath houses were open 121 times, giving a total of 8,546 baths. For the present, only school children and village health workers enjoy the privilege free. In the near future the facilities may be open to the general adult population, although there are certain difficulties in connection with the provision of towels and soap.

Smallpox. Vaccination against smallpox was unusually successful this year. In the spring the health stations and the village health workers made 32,116 vaccinations, including 9,380 primary vaccinations. The number of primary vaccinations is approaching the total number of births in the district per year, and makes up 29.2 per cent of all the vaccinations. The total cost of vaccination work in the spring was \$587.15, the cost per vaccination being less than two cents. About one-half of those vaccinated were under 10 years of age. 75.5 per cent of the primary vaccinations were of children under three years old. It seems clear that the vaccinations were reaching the most important groups, i.e., the nonvaccinated and the once-vaccinated.

The number of vaccinations given in the autumn is even more encouraging. In the fall of 1932, although a very strenuous effort was made, there were less than 1,000 vaccinations. This year, in a period of two months, there were 5,630, of which 35.5 per cent were primary. 82.1 per cent of the primary vaccinations were of children under three years. The gradual eradication of an old tradition that children should be vaccinated only in the spring time will undoubtedly contribute greatly to the control of smallpox. The cost of autumn vaccination is a little higher and amounts to about 3 cents each.

Cholera. Although there were no epidemics of cholera this year,

1,391 anti-cholera vaccinations were made at the stations. The willingness of the people to accept vaccination at a normal time shows their confidence in preventive measures. As a matter of fact many more people were willing to be vaccinated than were so advised.

Diphtheria. The method of three injections of toxin-antitoxin mixture is impractical under rural conditions. When the Epidemic Prevention Bureau at Peiping began to produce alum precipitate toxoid, the Health Division was among the first to cooperate with it on an experimental basis.

Last spring, Schick tests were given 575 children between 6 years to 14 years. 539 were read and 19.5 per cent found to be positive. Ninety-two of the group each received one injection of alum toxoid, sixty-four being retested after three months. Among sixty children who went through the first Schick test, one cc. injection of alum toxoid, and retesting, seven remained positive. In other words, it was found that the alum precipitate toxoid was used successfully in immunizing 89 per cent of the Schick-positive children.

In the meantime, Schick tests were given 352 preschool children aged from six months to five years, and 65 per cent were found positive. Therefore, the influence of age on reactions to the Schick test is evidently very great here and for practical purposes inoculation against diphtheria of the preschool group is far more important than the inoculation of school children.

An inoculation campaign was carried out in the month of April during which 168 preschool children were vaccinated. In the following months, 1,214 sisters and brothers of school children under 6 years old were inoculated with the toxoid. Constitutional reactions among these small children were practically negligible.

On the basis of these initial efforts larger campaigns will be carried out next year and it is hoped the anti-diphtheria work will follow more or less the course of anti-smallpox vaccination. If so, it will help demonstrate the method of control under rural conditions of another chief cause of mortality.

Health Education and School Health. The opportunity of the Chinese New Year, when thousands of the people in the villages come into the City, was again utilized for the annual health exhibit held at the district Health Center. 18,670 people attended the exhibit and 13,000 pamphlets on various topics of hygienic interest were distributed. In addition, every corner of the Center was open to the public and the visitors were much astonished to find how the hospital was equipped and how a microscope was used. Proper ways of bathing and feeding children were also demonstrated, appealing greatly to the curiosity of many young women.

Systematic education was conducted on a large scale in schools. A special nurse was assigned to the experimental Integrated Village Schools of the Movement to work out a series of textbooks on hygiene for primary school children. During the year, 1,599 hygiene classes were conducted in schools with a total attendance of 73,479 pupils. 1,140 talks on school hygiene were given to the teachers in sixty-seven schools under our supervision, with a total attendance of 1,738. The practice of hygienic habits was encouraged by the introduction into the schools of 167 earthenware spittoons, 1,546 wash-basins, 3,590 individual drinking cups, and by the improvement of 34 drinking wells and 30 latrines. Twenty-six schools agreed to supply boiled water to students and 640 disinfections of school wells were carried out in those schools where boiled water could not be obtained.

The health corps still forms the most effective means of cultivating cleanliness and health consciousness in the schools. As a result of hundreds of examinations, the final grading of cleanliness of the 5,920 children examined was 52 per cent grade A, 39 per cent grade B, and 9 per cent grade C. The standards of grading were the same as those used in previous years. 271 discussion meetings were held by the members of the health corps in different schools, with an attendance of 6,558.

Among the 5,920 children, 2,990 (50.1 per cent) were found to

have trachoma. After 191,262 treatments, it was found that 669 cases were cured. 727 showed improvement, and the condition of 1,594 remained unchanged at the end of the year. 20,196 treatments were given to 340 cases of ringworm of scalp. 139 were cured, 20 showed some improvement, and 181 no improvement. 7,929 treatments for discharging ears were given to 141 cases of chronic otitis media and at the end of the year 45 were practically cured. 2,159 children with dental defects were brought to the clinics for treatment and 805 cases were corrected. In addition, 2,337 first-aid treatments were given in the normal school by its attending nurse.

The importance of school health has been discussed repeatedly in previous reports, but there are two problems to be met. First, the question of personnel. Our experience shows that the nurse is the most proper and the only worker to be used in providing rural school health service. The nurse can cooperate with school teachers and is capable of giving all the service that is feasible, provided intelligent supervision is available. Besides a slight expansion of the scope of a nurse's work, such as inoculations against smallpox and diphtheria, can also effect the control of communicable diseases in a rural community. Second, the question of cost. Cooperation with school principals is generally possible in the village, and with good cooperation there is practically no need for the Health Department to furnish more than the salary of a nurse and his or her transportation. The schools in Ting Hsien pay for the cost of drugs used in the correction of defects and for the equipment for health education purposes. The total annual cost to the Health Division does not exceed 30 cents per capita. Calculating on the basis of a province like Kwangsi with a school population of about one million children, it would not cost more than \$300,000. There this amount of money is already available but because of the lack of trained personnel, nothing has been done. A special course for preparing the proper type of personnel will be described later.

Maternity and Child Welfare. It has been extremely difficult to

decide on the steps to be taken in dealing with midwifery problems. Maternal mortality in the district was known to be at least 12 per 1,000 births and the specific death rate of tetanus neonatorum over 300 per 100,000 population. Both are excessively high compared with even the most backward countries in Eastern Europe. However, midwifery, not to mention child welfare, had no economic foothold in the tradition of the people and midwifery had never been a "profession." Without the guidance of any precedent, the first effort was to introduce a midwife and a fairly experienced physician of obstetrics. This soon failed because the community would not accept a girl only twenty-five years old as a trustworthy midwife and the number of abnormal cases of labor were so few that the physician was a luxury. Furthermore, an analysis of cases handled by the midwife here, and also those handled by trained midwives elsewhere, shows that each delivery costs at least five dollars. As pointed out in previous reports, if midwifery work in a population of 400,000 such as we have in Ting Hsien, is to be handled by trained midwives, the total cost including transportation would amount to at least \$45,000. This is higher than the available budget for an entire program of medical protection. Referring difficult cases to trained physicians would entail additional cost, and yet without the assistance of a physician, the midwife, who is not supposed to deal with abnormal conditions, would lose as much confidence as she could win. Consequently, the scheme of using the midwife and physician in combination was abandoned.

Training of local "midwives," usually elderly women with some experience in handling births, represented the second phase of effort. In view of the illiteracy and ignorance of these women, special material for instruction had to be prepared, and a mature midwife with the best possible intellectual background and a high spirit of service was selected to take charge. After several courses had been given, it was found that the training would not be adequate without much practice under supervision. It was practically

impossible to correct the habits of a lifetime, or even to enforce cleanliness. The emergency nature of labor made sufficiently early notification for field supervision and assistance difficult, and even when it was possible the lack of quick and easy transportation was an insurmountable handicap. Thus the second phase was ended.

Before entering upon the third phase, an experiment in the training of young women related to the old "midwives" seemed to hold promise of a solution to the problem, but after a time it was found that this also was impracticable as the young women in the average family were generally too busy to fulfill the responsibilities of this extra and irregular work.

The third phase, essentially an attempt at education and demonstration, was evolved during the past year.

a. *Short Course for Housewives.* Organized training of flexible individuals was considered the most reliable means of applying knowledge. The first class was organized in September this year and held eighteen meetings, with an enrollment of thirty-two housewives and girls over eighteen years old. The course consisted of practice in home hygiene and child care, and, in addition, a few songs and simple homemade toys for children were introduced. Most of the women were interested and there was a total attendance of 303 for the course. The second class was started in November. On account of cold weather, only twenty were enrolled and up to the end of the year fourteen meetings were held. Following its completion the members of the class were organized into a Home Discussion Club to meet once a month.

At present the course is still too short to give thorough training in hygienic conduct; but it will serve as a sifting process through which we shall be able to recognize individuals with enthusiasm and initiative. Another organized course of training for the latter would lead to promoting welfare work with a minimum of encouragement.

b. *Prenatal and Postnatal Visits.* 213 prenatal visits were made by the midwife to homes of pregnant women and 224 attended prenatal and postnatal clinics. Compared with previous years, there is no significant increase of attendance.

c. *Deliveries.* Forty-nine deliveries were made by the midwife of the Health Center, thirty at the Center and nineteen in homes. There were

seven cases of difficult labor, but all were properly attended. Although the number of deliveries is rather small, many people in the City have recognized the superiority of the service rendered by the Division. In many cases young pregnant women were anxious to be attended by the trained midwife, but their mothers-in-law prevented them from requesting such help. The education of the elder women may be impossible, which would account for the slowness of the maternal work. The improvement of midwifery practice seems to be a question of two or three generations, even provided continuous education is carried on. Furthermore, upon analysis of the available data, out of the normal cases of delivery, about 40 per cent (19 out of 49) were done at home. The lack of tradition for delivery care in an institution rather than at home forms another obstacle to the rapid development of trained service in a rural community.

d. *Child Health Contest.* In the spring 406 children participated in the annual health contest. They were examined for cleanliness and general health, diseased children being rejected. Some parents brought their children from many miles. The local leaders, political and educational, were invited to be present at the contest. As prizes, useful articles were collected through voluntary contribution and given to the mothers of the children in the best state of health.

e. *Birth Control Education.* 835 families in fifteen villages were visited by a member of the Division. Among about 108 families needing birth control information, thirty-four accepted the advice. Economic difficulty, excessive number of children, and poor health of the mother were found to be the chief reasons for applying for the use of birth control devices.

Because of its private nature, there is an infinitesimal amount of sound consciousness for maternal welfare in the community. All the efforts mentioned above were intended to develop this consciousness, for without its application of modern knowledge by trained personnel, however strenuous, is economically impractical.

TRAINING

By means of the field activities recounted in the foregoing, three types of training have been organized. They may be briefly described as follows:

Postgraduate Course in Rural Health for Physicians. Before dis-

cussing the contents of the course it may be necessary to make a few general remarks. In the first place the word "postgraduate" needs explanation. Generally, it refers to additional training following an undergraduate course. But in view of the diversity of undergraduate training in the medical schools of China, it was extremely difficult to specify the requirements for postgraduate training. If the standard were limited to the highest type of undergraduate training, such as that given by the Peiping Union Medical College, candidates for the course would be few and they could do so little after completion of the course that the idea of extending the methods as worked out in the demonstrative stage would be hopeless. On the other hand, if the standard were fixed at the lowest type, such as that offered in the Taiyuanfu Provincial Medical School, the candidates would be so poorly trained, even in their theoretical background, that no training of a postgraduate nature could be built on it. Consequently the meaning of "postgraduate" is relative; and the standard of undergraduate training provided by the majority of ordinary medical schools has to be used as the working basis. Special training to overcome undergraduate deficiencies has to be considered an integral part of a practical postgraduate course in rural health in China.

Lastly, a postgraduate course is best conducted through responsibility, under supervision, for activities. Inasmuch as the field facilities in Ting Hsien are rather extensively developed, and are directly under the control of the Division, the opportunity of developing "learning by doing" seems unique. Each of the instructors has practical field responsibility, and development of incidental teaching in the routine process of discharging responsibilities and of discussions on personal experience are considered the most valuable type of postgraduate guidance in practical rural health.

The curriculum is scheduled for two years, the course for the first year including general rural problems; sepsis and elementary nursing practice; methods of diagnosis; health education and school health; training and supervision of village health workers; general principles of rural public health; control of smallpox; sanitation; rural medical relief; and administrative problems of rural health and practice in the health station. The second year is devoted to supervised practice in the health center and at health stations. This year four graduates of the Hopei Provincial Medical School were selected for training.

Postgraduate Course in Rural Health for Graduate Nurses. This course was created this year to answer the great demand for rural health

workers in country places. It started in November and is prescribed to last six months. The contents of the course include the following objectives: (a) To generalize school health work in accordance with available methods and experiences. (b) To supervise local midwives and detect early signs of abnormal labor. (c) To help control chief communicable diseases by performing vaccination against smallpox, diphtheria, cholera, and typhoid. (d) To help supervise village health workers. (e) To conduct health teaching to organized groups in villages.

Cooperative Training with Other Institutions. The Division continued to cooperate with the Peiping Union Medical College in a demonstration course in public health. Twenty-two third-year students and three postgraduate students spent three days in studying the work in Ting Hsien this year.

The Head of the Division was invited by the Director of the Hopei Provincial Medical School to take charge of the School's regular course in public health for undergraduate students. Four hours a week were devoted each week to a class of thirty-five students until their graduation in July, 1935.

The nursing students of the P.U.M.C. continued to come in groups for one week's practice in rural public health nursing. The midwife of the Division was also asked to take charge of the midwifery class in the Hopei Provincial Medical School for a period of six months.

The Division in addition undertook various teaching responsibilities for the Institute of Political and Social Reconstruction. At the moment of writing, the senior associate of the Division has been lecturing to a group of government workers at Suiyuan, a northwestern province of Inner Mongolia.

In preparation for the position of district health officer of Lanch'i, the experimental district of Chekiang, the National Health Administration sent Dr. Ho Ting-yao to Ting Hsien for one month practice. The Shanghai Medical School and the Health Department of the Shanghai Municipality also delegated a member of their staff to study the work in Ting Hsien for a period of two weeks. We have on the other hand recommended three of our physicians who had a great deal of practical training here to Wusih at the request of Mr. Kao, the director of Kiangsu Provincial College of Adult Education; to Kiangsi at the request of Mr. Chang Fu-liang, the director of the Kiangsi Social Welfare Centers under the National Economic Council; and to Hua Hsien of Shensi under the National Health Administration.

CONCLUSION

The foregoing descriptions lead us to conclude that the health organization has proved absolutely its workability under the rural conditions of North China. Its influence on the development of rural health in the country has also achieved national scope. The initiation of training in a systematic manner is intended to meet the various demands from different provinces for personnel. These would not have been possible without the technical and financial assistance of the Milbank Memorial Fund accorded since 1929.

However, there are two more necessary conditions for success. The first is the financial support of the health demonstration. This of course will depend upon the redistribution of the local government resources. In the past two years because of political uncertainties in North China and administrative difficulties in the local hsien government, it has not been possible to obtain any considerable sum of money for health. But from practically nothing at all, the local financial support of the Division has progressed to \$12,000, which is one-half of the total budget for the demonstration parts of the work. Provided political changes be favorable, there should be no difficulty in making the demonstrative aspect of the health organization entirely locally supported in one or two years.

Another problem is the fundamental training of physicians. The more contacts are made with graduates of Provincial Schools the more one feels their poor foundation. Without a good undergraduate background it is hard to raise the standard of postgraduate training and to maintain its efficiency. Ideas for a basic medical education have been crystallized in an article published in the September, 1935, issue of the *Chinese Medical Journal*. The ideology of the Ting Hsien Health Experiment would be incomplete without demonstrating the proper ways of conducting basic medical training to train physicians who will undertake the basic responsibilities that are required of them for the future of rural public health under the conditions of an agrarian state.

ANNOTATIONS

ACTIVITIES OF A RURAL HEALTH OFFICER

STUDIES of the daily activities of the staff of a rural health department, which have been conducted by the Office of Studies of Public Health Methods, United States Public Health Service, are unique and provide data which are basic to a better understanding of rural health work and to the evaluation of the efficacy and adequacy of the health services. In a series of articles,¹ data on the activities of the sanitation officer, the two nurses and the health officer of the Brunswick-Greenville Bicoounty Health Department in Virginia have been discussed. This is the entire staff, except for one part-time clerk, and it is typical of many rural health units throughout the country. These analyses utilize data obtained through the cooperation of the staff members who kept special records of their activities. The findings are of unusual interest to all persons concerned with the problem of adequate health service to rural areas.

Some of the findings of the report on the activities of the health officer of the Brunswick-Greenville Health Department are reprinted below. His work was considered in two general categories, namely, personal or professional services and administrative activities, such as correspondence, working on records and reports, planning the program, conferring with officials and staff members, et cetera. All work was recorded for a period of ten months.

EXTENT AND DISTRIBUTION OF INDIVIDUAL AND GROUP SERVICES RENDERED BY THE HEALTH OFFICER

Number and Color of Individuals Served. During the period of the

¹ Dean, J. O. and Mountin, J. W.: Job Analysis of a Rural Sanitation Officer. *Public Health Reports*, United States Public Health Service, December 21, 1934, 49, No. 51; McIver, Pearl: Public Health Nursing in a Bicoounty Health Department. *Public Health Reports*, United States Public Health Service, April 5, 1935, 50, No. 14; Dean, J. O.: Job Analysis of a Rural Health Officer. Brunswick-Greenville Health Administration Studies No. 6. *Public Health Reports*, United States Public Health Service, December 13, 1935, 50, No. 50.

| | COLOR | | TOTAL |
|-----------------------------------|--------|---------|--------------------|
| | White | Colored | |
| Population of health district | 14,253 | 19,621 | 33,874 |
| Number served by health officer | 1,431 | 2,559 | 3,992 ¹ |
| Per cent served by health officer | 10.0 | 13.0 | 11.8 |

¹Includes two persons of unknown color.

Table 2. Number and percentage of population served by health officer in a period of 10 months according to color.

study, records were obtained showing some type of service to 3,992 individuals, approximately 12 per cent of the entire population. These individuals represented 2,496 families, or about 37 per cent of all families within the area. A larger percentage of the colored population was served than of the white group. The number and percentage of persons seen in each group are listed in Table 2.

Place of Service. The principal activity of the health officer from the standpoint of numbers served was diphtheria control. Most of this was Schick testing and was done in the schools. Approximately 90 per cent of those the health officer served were seen in the school, about 7 per cent in the health department offices, 4 per cent in the homes, and 1 per cent in other places.

A great majority of the individuals were recorded as receiving but one visit; therefore very few of them were seen except at the place of first contact. Only fifty-five individuals were seen at two or more places. The number and percentage of persons seen in school, office, home, and other places are given in Table 3.

It is of interest to note that while 64 per cent of all those served by the health officer were colored, of those seen in either home or office only 33 per cent were colored.

Age Group Served. As already pointed out, most of the contacts were

Table 3. Number and percentage of persons served by health officer in school, health department offices, home, and other places.

| | NUMBER | PERCENTAGE OF TOTAL NUMBER OF PERSONS SERVED BY HEALTH OFFICER |
|---|--------|--|
| TOTAL NUMBER OF PERSONS SEEN ¹ | 3,992 | 100.0 |
| Seen in school | 3,583 | 89.8 |
| Seen in health department offices | 268 | 6.7 |
| Seen in home | 151 | 3.8 |
| Seen in other places | 46 | 1.2 |

¹Fifty-four persons seen at two places; one person seen at three places.

made in the schools in connection with diphtheria-prevention activities. While a large part of the publicity attending this work was directed toward reaching children below school age, school children (6-15 years of age) constituted over 81 per cent of all contacts. There were no accurate figures available on the population according to age groups at the time of the study. However, on the basis of figures given in the United States Census of 1930, population estimates have been made. The percentage of persons in each age group receiving service from the health officer was as follows: Infants 4.5, preschool 5.8, school 33.9, adult 2.4.

Types of Service Rendered and Number of Contacts Made with Each Individual. . . . Approximately 90 per cent of the 3,992 individuals served by the health officer received some type of immunization service, 5 per cent were visited in the interest of communicable disease control, 6 per cent were seen for either medical care or material relief, and less than 2 per cent were visited for other purposes. There is some duplication of individuals in these percentages, but the amount is small, since only 100 individuals sought more than one type of service. . . . Of those who were recipients of an immunization service (excluding the reading of Schick tests), approximately 72 per cent were seen but one time. Of those seen for communicable disease control and medical or material relief, 65 and 63 per cent, respectively, had one visit.

ADMINISTRATIVE ACTIVITIES

Much of the attention of the health officer was occupied by activities which were of an administrative character as distinguished from those involving an element of personal service.

Conferences. The number of conferences held during the study period was 219. Most of these were for the purpose of planning or discussing some part of the health department program. Thirty-five conferences were held with physicians; twenty-two of these were in regard to clinics or the control of communicable disease, and the remainder were for the purpose of arranging medical care. Fourteen of the eighteen practicing physicians residing within the county were represented among the ad-

Table 9. Number of conferences held by health officer during study period.

| PERSONS OR GROUPS | NUMBER | PERSONS OR GROUPS | NUMBER |
|------------------------------------|--------|---|--------|
| Physicians | 35 | Community leaders | 8 |
| County superintendents of the poor | 32 | Members of health department staff | 10 |
| Members of state health department | 29 | U. S. Public Health Service representatives | 14 |
| County boards of supervisors | 16 | Others | 24 |
| County superintendents of schools | 12 | | |
| Other county officials | 17 | | |
| Town officials | 13 | | |
| Teachers | 9 | TOTAL | 219 |

| | HOURS | |
|---|---------|----------|
| | Number | Per cent |
| Service to individuals | 472.0 | 31.4 |
| Immunization service | 223.4 | 14.9 |
| Control of communicable disease | 143.4 | 9.5 |
| Arranging for or investigating the need of medical or material relief | 76.1 | 5.1 |
| Miscellaneous services | 29.1 | 1.9 |
| Staff supervision and conferences with members of staff or of State health department | 182.5 | 12.2 |
| Conferences with officials, teachers, doctors, community leaders, and others | 124.1 | 8.3 |
| Supervision of health department clinics | 115.4 | 7.7 |
| Administrative duties other than conferences, clinics, or staff supervision | 608.0 | 40.5 |
| Reports and correspondence | 160.5 | 17.3 |
| Attending meetings | 10.5 | 0.7 |
| Reading and study of journals and scientific publications | 30.0 | 2.0 |
| Other and unclassified | 307.0 | 20.4 |
| TOTAL | 1,502.0 | 100.0 |

Table 10. Distribution of health officer's time on duty over a period of ten months.

ministrative contacts. The interests represented by the individuals with whom the health officer conferred and the number of conferences are presented in Table 9.

According to the purpose stated on the record, 43 per cent of the conferences were to plan or discuss health department service, 14 per cent were in regard to health department appropriations, and 22 per cent were held because of medical or material relief problems. The remainder were for miscellaneous purposes. About 45 per cent of the conferences took place in the health department office at Lawrenceville; 52 per cent were held on the premises or in the offices of those seen; and the remaining 3 per cent were held in other places.

Time Analysis. Counting Saturdays as half days, the health officer was on duty 225 of the 231.5 work days contained in the ten-month period of the study. His records accounted for a total of approximately 1,502 hours on duty, which was an average of 6 hours and 40 minutes per day, thus approximating a work day of 7 hours. The time spent on duty was the customary amount for that locality. Nearly 58 per cent of the time was spent on duties connected with the health department offices, 20 per cent was consumed by automobile travel, about 8 per cent was spent in schools, 4 per cent in the homes of patients or other persons, and 10 per cent was spent in other places in the field.

DOROTHY G. WIEHL

IN this day of intense nationalism it is good to find a new book devoted to a dispassionate analysis of immigration problems. Taft's *HUMAN MIGRATION*¹ is a study of international population movements with special reference to recent migrations to the United States. Intended as an objective treatment of migration and of attitudes and policies concerning international movements, its scope is broad and its viewpoint transcends that of the ardent nationalist.

Describing the uneven distribution of mankind and goods as the geographic and economic setting for population movements, the author examines the ethical principles of migration from the point of view of the migrants themselves, of the people left behind, of the people receiving the migrants, and also of supposedly impartial students of population. Characteristically, the author presents opinions of "authorities" on the subject, points out the limitations of such discussions, and leaves the reader with no dogmatic conclusions. He does emphasize, however, that if migration policies were divested of prejudices and dealt with the needs of all concerned, the question of ethics could be disregarded.

As a background of this country's problems and policies the author traces briefly the history of immigration and the restrictions surrounding it. Prior to 1882 there was virtually no federal control of immigration and the "open door" policy prevailed. Until that time, too, the migrants were largely from northern and western Europe and were readily absorbed by the available lands and by the expanding industrial and transportational pursuits of a young country. The year 1882 marked the beginning of a shift in the origin of immigration from northern and western to southern and eastern Europe; it was approximately the time of the Chinese Exclusion Act; and it inaugurated the beginning of federal control of immigration. From 1882 until the World War, however, the annual stream of immigrants was larger than ever before. Organized labor favored restriction but organized industry saw in this stream a supply of cheap labor. Consequently, these groups contended for opposite forms of immigration policy. The post-war nationalism, and perhaps the turn of events in Russia, made the industrialists feel that the risks of radicalism constituted high costs for cheap alien labor, so these interests allied themselves with other groups seeking restrictive legislation.

¹ Taft, Donald R.: *HUMAN MIGRATION; A STUDY OF INTERNATIONAL MOVEMENTS*. New York. The Ronald Press Company, 1936, 590 pp.

The flow of immigrants into this country subsided considerably during the World War and in 1917 the literacy test was enacted to prevent resumption of the large-scale entries. By this time there was also much concern over the "quality" of immigrants. Nationalism was fed by pseudo-scientific racial doctrines. In 1921 the quota law was enacted as an emergency measure to stem the post-war flow of immigrants and to control their "quality" until a permanent measure could be adopted.

Without any semblance of sensationalism but also without mincing words, the author reminds us of the rôle of pseudo-scientific theories in bringing about the American Immigration Act of 1924. He points not only to the widely circulated theories of "Nordic superiority" but also to the misleading racial data submitted before the House Committee on Immigration when the Act of 1924 was under discussion in Congress. As enacted, the law of 1924 constitutes the basis for our present system of discriminative restriction. In general, it permits a maximum of 150,000 immigrants each year, apportioned among different countries on a basis of representation of specific nationalities in our population in 1920. It favors countries of northern and western Europe on the implicit assumption that groups from those areas are more desirable than others.

Throughout the book the author's viewpoint is that of the sociologist. While admitting the need for intelligent control of migration, he views as socially stimulating the contacts and conflicts of diverse cultures. Rigid barriers against immigrants, he contends, stultify cultural advance and foster intolerance and ethnocentric ideas. The social problems which are frequently characteristic of immigrant groups, such as delinquency and crime, are viewed as merely temporary disturbances inherent in the process of adjustment to a new environment. Public health leaders have recognized the peculiar health problems of foreign groups in congested city areas. It is interesting to note that the author thinks some of the finest social relationships between immigrants and natives have developed in the field of public health. Such contacts have led to assimilation of health ideas and practices and have often opened the way for assimilation in other directions because they have developed mutual understanding between immigrant groups and socially-minded Americans.

While international attempts to control immigration have been hampered by national jealousies, and although whole-hearted cooperation between various countries in solving social problems appears remote, the author believes strongly that solution of migration problems necessitates

the joint action of all nations involved. He points to the bilateral control of the migrations of Poles to France as an example of active cooperation in working out mutually satisfactory policies of migration.

To the general reader the materials in the book may appear at first to be poorly organized. However, the book was intended primarily as a text for mature students, and the author has attempted to present in a single volume a mass of material dealing both with critical analyses of investigations and with prevalent attitudes concerning problems of migration in their many ramifications. Consequently, the author has found it necessary to interweave factual accounts of population movements and their restrictions with discussions of the cultural, economic, and biological implications of these movements. It is hoped that the influence of this book will not be restricted to the academic circles for which it was written. Its impartial consideration of the whole migration problem is in striking contrast with the one-sided theories which are the bases for prevalent attitudes toward migration.

CLYDE V. KISER

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THE RECENT TREND IN MORTALITY FROM TUBERCULOSIS AT YOUNG ADULT AGES

It is a well-known fact that tuberculosis mortality in the United States is declining rapidly. But we have no satisfactory factual explanation as to why it is declining less rapidly in rural than in urban areas, or as to why the mortality among males at certain ages is declining more rapidly than for females at similar ages.

A serious attempt has been made in England and Wales to discover through the use of available statistical material the reasons for an increase in recent years in the death rate among young adult females and the slow rate of decline among males at the same ages in that country.¹ Study of the trend of mortality from pulmonary tuberculosis shows that the decline of 75 per cent in mortality at all ages during the period 1851-1860 and 1921-1930 has not been equally derived from the different ages of life. Between 1851-1860 and 1901-1910 the improvement observed was considerably greater for persons under 35 years of age, than in middle and old

¹ Hill, A. Bradford: The Recent Trend in England and Wales of Mortality from Phthisis at Young Adult Ages. *Journal of the Royal Statistical Society*, 1936, xcix, Part II.

age. At the young adult ages, 15-25, the death rate of males was in 1901-1910 only one-third of the rate in 1851-1860, while the death rate of females was about one-quarter the rate in the previous period.

Between 1910 and 1930, excluding the war years, a considerable change in the trend of mortality from pulmonary tuberculosis among young adults in England and Wales was noted. The mortality at these ages declined among males at a slower rate than was apparent in any other age group. Among females there was a slight rise in mortality at ages 15-24 and at ages 25-35 the decline was appreciably less than that observed in any other age group. A division of the country into its administrative areas (urban and rural) showed that the unfavorable change was most apparent in the urban areas.

Inquiry was made as to the influence of the following factors upon the recent trend of the young adult death rate:

1. A decline of immunization in childhood as a result of the fall in the general death rate from tuberculosis producing a lower level of infection in early life.
2. Changes in the occupational environmental conditions of young adults, especially the entry of young females into new occupations.
3. Changes in the regional distribution of population of young adult ages through the slackening of migration from country districts to the towns.

Infection in Childhood. The death rate from all forms of tuberculosis at ages 0-5 was taken as a measure, though admittedly imperfect, of the pressure of infection in childhood. Changes in this death rate over a period of years in a group of English counties were found not to be correlated with changes in the mortality at young adult ages in subsequent years. Hill concludes that, "In general the statistical evidence available (admittedly slender) does not suggest that the level of the phthisis death rate amongst young adults in different areas of the country is materially due to different degrees of immunization in childhood."

Occupational Changes. Preliminary to the changes in female occupations, the trends of mortality from pulmonary tuberculosis for young adult males and young adult females during the years 1911-1913 to 1929-1931 in large urban areas, were examined and compared. Where the female rate showed the greatest increase there was, on the average, a tendency for the male rate to increase also or to show a slower rate of decline than in other towns. Where the female rate declined substantially the male rate, on the average, also declined substantially. The author con-

siders that this suggests that some factor common to both sexes is present and that the special occupational-environmental changes in female life are unlikely to be more than a partial factor.

Only a slight change in the volume of female employment in England and Wales was noted between 1911-1931 and no significant correlation was found between changes in the total volume of female employment and changes in the pulmonary tuberculosis death rate of young adult females. The death rate of females aged 15-25 in the county boroughs did not show any appreciable degree of correlation with the proportion of females employed in factories or in clerical work, but tended to be low where the proportion of women in domestic service was high. This latter relationship was explained on the grounds that where the proportion of women in domestic service is high, there exists a higher proportion of persons in the more economically-favored classes whose death rate from pulmonary tuberculosis is relatively low.

Internal Migration. One striking fact about the mortality from pulmonary tuberculosis among young adults in England and Wales, mentioned in this study, was that in past years there have been higher death rates registered in the rural areas compared with the urban areas, an occurrence observed only at the young adult ages. It was believed that this was due to the migration of young adults from the country to the towns. Two possible explanations were given: (1) that the young adult migrating to the towns or urban centers tends to acquire infection there and returns home to die; (2) that the migrants are a physically select group which strengthens the town population and leaves a physically weaker residue behind. Evidence was believed available to support the second explanation.

Various measures of the loss or gain by migration, at all ages and at young adult ages, in the county boroughs between 1921 and 1931 were correlated with the changes observed in the pulmonary tuberculosis death rate of young adults during these years. A substantial degree of correlation was found. The county boroughs which attracted young adults have, on the average, shown a declining death rate from pulmonary tuberculosis in young adult life; those that have lost population tend to show a rising death rate. Figures for the rural areas suggested a similar relationship, though to a much less pronounced degree.

The author concludes that, "change in migration is unlikely to be the only factor influencing the trend of a form of mortality which is of com-

plex causation, but the evidence suggests that it is a factor which, directly or indirectly, is of some importance, and must certainly be considered in the interpretation of the rates observed in specific areas."

Hutchinson studied internal migration and its effect upon the tuberculosis mortality for the entire resident population of Stockholm² for the years 1921 and 1922. Environment at the time of observation was held constant by restricting the comparison to population groups living in the same area and subject to the same external conditions. The tuberculosis death risk of the Stockholm-born was found to be from 25 to 30 per cent greater than that for the in-migrant population. The author concludes that the higher mortality of the Stockholm-born population could not be attributed wholly to selection of the better risks in migration to the City, or to a less favorable socio-economic status. In fact the in-migrants tended to be more heavily represented in the social groups normally showing the highest tuberculosis death rates. It should be added that more detailed data than were available for this study are necessary for a thorough investigation of the influence of the selective process incident on rural-to-urban migration.

Both studies indicate the importance of the factor of internal migration as directly or indirectly affecting the tuberculosis mortality, yet neither has satisfactorily explained the reason for its apparent effect.

Data for such detailed study of the trend of tuberculosis mortality as that made in England are not available in the United States. However, a comparison of the post-war (1921-1931) trend at various ages with that of the pre-war period (1900-1916) in the original death registration area of the United States in contrast to the English experience shows no increase in the death rate among young adults of either sex.³ In fact the downward trend of tuberculosis has greatly accelerated during the post-war period for both sexes and at all ages except over 65 years. A comparison of males with females indicated that the trends at various ages for both periods are, with one exception, greater for the latter. The exception was found to be for the post-war age group, 15-24, in which the male decline was -6.12 per cent annually and the female decline -4.42, a difference of 1.70 per cent which was considered statistically significant. The author ven-

² Hutchinson, E. P.: Internal Migration and Tuberculosis Mortality in Sweden. *American Sociological Review*, April, 1936, i, No. 2.

³ Watkins, J. H.: Post War Changes in the Trend of Tuberculosis Mortality. *The American Review of Tuberculosis*, August, 1935, xxxii, No. 2.

tures to suggest that this difference may be due in part to the fact that women, during the period under consideration, have entered the occupational fields in large numbers and are thus exposed to new hazards.

These studies indicate salient characteristics of tuberculosis mortality which are of interest to the worker in public health. Effective control of the disease will in the future demand a more complete understanding of the factors causing differential death rates at various ages and in dissimilar areas.

JEAN DOWNES

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MUNICIPAL COSTS OF SYPHILIS

A CAREFUL evaluation of the costs of a disease as manifold in incidence and in pathology as syphilis is a gigantic undertaking. Perhaps for this reason the subject has been approached from various special angles such as the cost of treatment in private practice or the costs of clinic service. Among these special angles of approach, one—the community cost of syphilis—should be of interest not only to the sanitarian but to every other citizen as well. The sources of data for such a study are various depending upon the community and resort must be had to estimate where financial records do not permit of determining the precise costs.

A pioneer study of costs in this country was conducted in St. Louis in 1932 by the Missouri Social Hygiene Association in cooperation with the American Social Hygiene Association under the immediate direction of H. C. Loeffler of the St. Louis Bureau of Municipal Research.¹ The author states at the outset that no attempt is made to differentiate the costs of gonorrhea and those of syphilis, and further, that some of the estimates made are, at best, approximations. Particularly is this true of the estimates of the amounts paid by patients to private practitioners. The author attempts a comprehensive study but declines to evaluate costs in such fields as "Losses to Industry and Society," where even the basis of estimate is ill-defined. The final figure for the annual costs in the City of St. Louis is considered to be between \$2,071,395 and \$2,559,916. The St. Louis study beside being a pioneer attempt has the merit of outlining

¹ Loeffler, H. C.: *Costs of Venereal Disease to St. Louis*. A pamphlet published by the Missouri Social Hygiene Association, 340 North Vandeventer Avenue, St. Louis, Missouri.

many of the directions in which economic losses due to venereal diseases occur, and the difficulties encountered in computing them.

A second, and more conservative attempt at municipal cost evaluation is that of Thompson, Brumfield, and Caldwell² for the City of Baltimore, in 1932. They emphasize the fact that syphilis is, economically, of far greater importance than gonorrhea, and restrict their study, therefore, to that disease alone. The pitfalls of a comprehensive attempt at cost evaluation are outlined and the study consequently restricted to "such data as could be determined with reasonable accuracy." This narrowed the field primarily to the expense to the taxpayer and to endowed charity of the diagnosis and treatment of syphilis, thus retaining the cost aspect of the greatest public interest and eliminating, to no small degree, the need for estimates. The authors point out that the St. Louis total for syphilis, derived in this way, would have been in the neighborhood of \$300,000.

The factual findings of the study were grouped under five chief items of cost, and are summarized below.

Hospitalization. In the thirty-three hospitals and institutions whose records were reviewed, a total of 2,214 patients were found to have had a diagnosis of syphilis, but only 615, or less than one-third, were found to have been hospitalized primarily on account of the disease. The authors determined the hospital costs of this group only, and found that they totaled \$75,236.93; of this sum 66 per cent was paid by City and State taxpayers, 29 per cent chiefly by endowed charities, and only 5 per cent by the patients themselves.

Clinic Service. The cost data here were calculated on the basis of total number of visits and actual or estimated cost per visit. The total was considered to be \$61,597.82. Of this amount it was found that 47 per cent was paid by the taxpayers of the City and State. Fragmentary data on receipts from patients made the allocation of the balance questionable, but \$7,512.48 is known to have been paid by patients in one clinic reported upon. They further point out that the under-financed City clinics are restricted to the treatment of actually or potentially infectious cases and that hospital clinics are overcrowded and cannot always take care of patients needing treatment.

Serologic Laboratories. The cost here was determined by the total number of specimens other than those performed in private laboratories, and the cost per specimen (in some cases estimated). The figure of \$35,285.86 was considered to be low for the City as a whole.

Anti-syphilitic Drugs. Data from this study were reported to be in-

² Thompson, W. C.; Brumfield, W. A.; and Caldwell, Lucille: The Direct Cost of Syphilis in a Representative American City. *American Journal of Syphilis, Gonorrhea, and Venereal Diseases*, May, 1936, 20, No. 3, p. 243.

| | TOTAL COSTS | PAID BY PATIENTS |
|---|--------------|-----------------------|
| TOTAL | \$180,748.06 | \$11,063.83 |
| Costs of hospitalization | 75,236.93 | 3,529.35 |
| Costs of ambulatory clinics | 61,597.81 | 7,512.48 ¹ |
| Costs of Wassermann laboratories | 35,285.86 | |
| Costs of anti-syphilitic drugs | 7,234.17 | |
| Costs of hospitalization probable but not proved syphilis | 1,393.28 | 22.00 |

¹Receipts from one clinic alone were available.

Recapitulation of costs.

complete, so that the total of \$7,234.17 was considered likewise to be a minimal one.

The authors give the accompanying table by way of summary and state that the total of \$180,748.06, minus the amount paid by patients, was \$169,684.23, the direct cost of syphilis to the City of Baltimore for the year 1933. Of this latter sum, they estimate that 55 per cent was paid by taxpayers and 45 per cent by endowed charity.

The fact that the authors have erred, if at all, on the side of underestimate, makes these figures the more impressive.

The authors have gone further than the mere tabulation of costs and have shown one of the prime values of this type of study—the directions in which the present expenditures are inadequate and the ways in which ultimate economy could be effected. In estimating the cost per laboratory specimen examined in various laboratories they show that this varies between 11 cents and \$5.00 depending upon the number of specimens examined annually and suggest that small laboratories account in part for high costs in this field.

Their final and perhaps most important conclusion is that, in view of the large total expenditure for the hospitalization of late cases of syphilis, a very important saving could be effected by increasing the sums available for clinic—particularly for city clinic—treatment so that latent as well as active cases can be adequately treated before the conditions requiring hospitalization develop.

They leave with the reader the conclusion that many other cities besides Baltimore, with a per capita tax expenditure of not far from 10 cents, and with extensive aid from endowed institutions in the treatment of syphilis, require a still greater outlay to cope with all forms of the disease.

RALPH E. WHEELER, M.D.

THE PROBLEM OF ABORTION¹

RECENT studies in maternal mortality and morbidity have shown that between 18 and 25 per cent of all maternal deaths are associated with abortion. In analyzing the material to determine how maternal deaths may be prevented, however, most students of the subject have avoided the discussion of abortion. Dr. Taussig and the National Committee on Maternal Health, which sponsors his book, *ABORTION, SPONTANEOUS AND INDUCED*, are to be congratulated on publishing a dignified authoritative text which approaches the problem of abortion from all points of view, and brings it squarely into the open as a public health problem.

The book presents a complete discussion of the diagnosis, treatment, and prevention of abortion, preceded by a review of the history of the problem, and followed by a discussion of the legal and social aspects of abortion in the United States and abroad. The text is complete and well arranged for both reference and teaching.

Dr. Taussig's discussion of statistics of abortion reviews all of the available literature on the subject, but is insufficiently critical of the relative undependability of most of the statistical material. His estimates of the number of abortions in the United States as well as of the morbidity and mortality rates traceable to abortion are merely guesses and should be so regarded. The statistical material is confined largely to studies of highly selected samples in the United States and abroad and its limited applicability should be understood by the reader. Unfortunately, there is no better material available.

In the discussion of means of preventing mortality and morbidity due to abortion, Dr. Taussig emphasizes the preventability of spontaneous abortion by proper medical care, especially from the point of view of expectant treatment in cases of habitual abortion. The chapter on therapeutic abortion discusses not only the indications for and techniques of therapeutic abortion, but also the possibility of avoiding abortion in many cases in which proper treatment of the underlying systemic disease is the better method of care. Taussig feels that the problems of spontaneous and therapeutic abortion need further study before standards of medical care for these conditions can be established.

Illegal abortion is probably responsible for the bulk of maternal deaths due to abortion, and prevention of mortality and morbidity due to illegal

¹ Taussig, Frederick J., M.D., F.A.C.S.: *ABORTION, SPONTANEOUS AND INDUCED. MEDICAL AND SOCIAL ASPECTS*. St. Louis, The C. V. Mosby Co., 1936, 536 pp. \$7.50.

abortion is difficult because the problem is officially unrecognized except in its criminal aspects. Dr. Taussig concludes that abortion should be recognized as a public health problem. He feels that the prevalence of illegal abortion among married women with large families² calls for increased social security and adequate housing as a means of encouraging the carrying of these pregnancies to term. He believes that illegal abortion can be prevented to a great extent by the liberalizing of medical and social indications for therapeutic abortion, by the establishment of adequate contraceptive services, and by sterilization in cases in which pregnancy is contraindicated.

The abortion laws of the United States are very much less liberal than the present situation would lead us to believe. In six states *all* abortions are illegal; in thirty-eight states, including New York, abortion is permissible only to save the *life* of the mother, and in only five states is it permitted in order to save the *life or preserve the health* of the mother. Dr. Taussig believes that clarification and liberalization of these statutes is necessary in order to place the responsibility for preserving the health of the mother and the best interests of the family as a whole on the shoulders of the physician, preferably in cooperation with a hospital. He feels, however, that complete legalization of abortion has been proved undesirable by the Russian experiment. It has been found that, although mortality following legalized abortion is very low, the frequency of late sequellae is such that the Soviet government has recently passed a law limiting abortion to cases in which it is necessary.

In summarizing his point of view on the means of controlling abortion, Dr. Taussig suggests the following measures:

1. Intensive study of the underlying causes of spontaneous abortion and its prevention.
2. Better training of physicians in the prevention and treatment of abortion.
3. Better hospital facilities for abortion patients.
4. Improvement in home and working conditions for the pregnant mother.
5. Broader and more humane indications for medical interruption of pregnancy.
6. A change in our laws permitting medical intervention in place of the prevalent resort to personal manipulations, or to induction by a professional abortionist or midwife.

² Such statistical material as is available on the prevalence of abortion in selected samples of the population points with great consistency to the fact that abortion is most frequent among married women who have already had several children.

7. Education of women concerning the dangers of abortion.
8. Improved economic and housing conditions among the poor, to decrease the necessity for resorting to abortion.
9. Sterilization of those who for medical reasons should not have more children, or any children at all.
10. Widespread establishment of maternal health clinics under medical control to teach women *safe and harmless* methods of contraception.³

He concludes his book with the following challenge to his medical colleagues: "The medical profession must assume full responsibility for the appalling frequency of abortion and its high death-rate, if it fails to attempt correction of these fundamental evils."⁴

REGINE K. STIX, M.D.

. . .

CONTROL OF CANCER

CANCER is today one of the leading causes of death and will in the future be more generally recognized as one of the important problems in the field of public health. Massachusetts has been the first state to inaugurate through its Health Department a program for the control of the disease. The program is now in its tenth year and Dr. Henry D. Chadwick, commissioner of public health, reported that the death records for 1935 show the first decrease in cancer deaths of both sexes simultaneously in the twentieth century.¹ The mortality from cancer (adjusted for age) during the period 1920-1932 in that State has been practically stationary for females with rates varying from 125 to 130 per 100,000. Death rates from the disease among males have ranged from 84 to 107 per 100,000 population.

The Massachusetts cancer program contains five major activities: hospitalization, tumor diagnostic service, research, diagnostic clinics, and education. An individual with symptoms of cancer is advised to go to his physician and physicians are urged to use the cancer clinics as consultation centers. A comparison of the clinic statistics for the years 1927, 1931, and 1935 shows some interesting changes. "The duration of delay between first symptoms and first consultation with a physician has de-

³ *Loc. cit.*, p. 446.

⁴ *Loc. cit.*, p. 452.

¹ Chadwick, H. D. and Lombard, H. L.: The Massachusetts Cancer Program. *The New England Journal of Medicine*, August 13, 1936, 215, No. 7.

creased slightly over the period but not to the extent desired. The duration of delay between the first visit to a physician and attendance at a clinic has shown a marked improvement in the last four years (from 5.8 months to 3.3 months) but even now this delay is too great. The percentage of patients referred to clinics by physicians has increased markedly both for total attendance and for cancer patients."

The Pondville Hospital, with a capacity in 1935 of 145 beds, admits patients with cancer and with suspicion of cancer, who cannot otherwise receive adequate care. Bed facilities for the disease are inadequate and an additional cancer hospital has been authorized by the State Legislature.

The results of this program in Massachusetts which is being carried on through the cooperation of the medical profession and the State Department of Public Health will be of unusual interest because it is believed that at least a partial control of the disease can be attained. Concerning this problem, Dr. Thomas Parran, Jr., Surgeon General of the United States Public Health Service, has expressed the possibilities of preventive medicine most concisely as follows: "Deaths from cancer are increasing and stand second among all causes. Yet at least 20 per cent of them could be prevented if cases could be recognized early and if we had everywhere the facilities for proper diagnosis and treatment."²

JEAN DOWNES

² Parran, Thomas, Jr.: Health Security. *The Milbank Memorial Fund Quarterly*, April, 1936, xiv, No. 2, pp. 113-124.

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